



Title	Systematics and evolution of weevils of the genus <i>Bagoos</i> Germar (Coleoptera: Curculionidae) II. Taxonomic treatment of the species of Japan
Author(s)	O'Brien, Charles W.; Askevold, Ingolf S.; Morimoto, Katrura
Citation	ESAKIA    34    p1-73
Issue Date	1994-03-24
URL	<a href="http://hdl.handle.net/2324/2570">http://hdl.handle.net/2324/2570</a>
Right	

This document is downloaded at: 2012-10-12T15:59:26Z

## **Systematics and evolution of weevils of the genus *Bagous* Germar (Coleoptera: Curculionidae) II. Taxonomic treatment of the species of Japan'**

Charles W. O'BRIEN, Ingolf S. ASKEVOLD

Entomology - Biological Control, Florida A & M University,  
Tallahassee, FL 32307

and

Katsura MORIMOTO

Entomological Laboratory, Faculty of Agriculture, Kyushu  
University, Fukuoka, 812 Japan

Abstract. The Japanese species of *Bagous* are treated systematically; 17 species are recognized, of which 15 are newly described. These new species are *B. buckinghami* O'Brien and Morimoto, *B. fractus* O'Brien and Morimoto, *B. fritodes* O'Brien & Morimoto, *B. lewisi* O'Brien & Morimoto, *B. minor* O'Brien & Morimoto, *B. occultus* O'Brien & Morimoto, *B. proprius* O'Brien & Morimoto, *B. pygmaeodes* O'Brien & Morimoto, *B. rotundatus* O'Brien & Morimoto, *B. ryukyensis* O'Brien & Morimoto, *B. spiculatus* O'Brien & Morimoto, *B. subcordatus* O'Brien & Morimoto, *B. subvittatus* O'Brien & Morimoto, *B. tuberculosus* O'Brien & Morimoto, and *B. youngi* O'Brien & Morimoto; *B. bipunctatus* (Kôno) and *B. kagiashi* Chûjô & Morimoto were previously described.

Eight species groups are recognized, the *B. pygmaeus* group (including *B. minor* and *B. pygmaeodes*), the *B. bipunctatus* group (including *B. subcordatus*, *B. bipunctatus*, *B. occultus*, *B. spiculatus*, *B. kagiashi* and *B. ryukyensis*), the *B. proprius* group (including *B. proprius*), the *B. buckinghami* group (including *B. buckinghami*), the *B. fractus* group (including *B. fractus*), the *B. rotundatus* group (including *B. rotundatus*), the *B. transversus* group (including *B. youngi*), and the *B. frit* group (including *B.*

**fritodes**). Three species (***B. lewisi***, ***B. subvittatus*** and ***B. tuberculosus***) remain unassigned to species group because they are known only from female specimens and do not possess specific characters that allow them to be assigned with certainty.

A key to species, diagnosis of species groups and each species, habitus photographs and line illustrations of male and female genitalia are provided.

## CONTENTS.

Introduction	3
Materials and Methods	3
Selected Genital Structures used in Classification of <b><i>Bagous</i></b>	5
Taxonomic Treatment of <b><i>Bagous</i></b> Germar	8
Placement of <b><i>Bagous</i></b> within Curculionidae	9
Key to Japanese Species of <b><i>Bagous</i></b>	10
Taxonomic Treatment of Japanese Species of <b><i>Bagous</i></b>	12
<b><i>Bagous pygmaeus</i></b> group	12
<b><i>Bagous minor</i></b> O'Brien & Morimoto	12
<b><i>Bagous pygmaeodes</i></b> O'Brien & Morimoto	15
<b><i>Bagous bipunctatus</i></b> group	18
<b><i>Bagous ryukyuensis</i></b> O'Brien & Morimoto	18
<b><i>Bagous kagiashi</i></b> Chûjô & Morimoto	21
<b><i>Bagous spiculatus</i></b> O'Brien & Morimoto	24
<b><i>Bagous occultus</i></b> O'Brien & Morimoto	27
<b><i>Bagous subcordatus</i></b> O'Brien & Morimoto	30
<b><i>Bagous bipunctatus</i></b> (Kôno)	32
<b><i>Bagous proprius</i></b> group	35
<b><i>Bagous proprius</i></b> O'Brien & Morimoto	35
<b><i>Bagous fractus</i></b> group	38
<b><i>Bagous fractus</i></b> O'Brien & Morimoto	39
<b><i>Bagous buckinghami</i></b> group	41
<b><i>Bagous buckinghami</i></b> O'Brien & Morimoto	42
<b><i>Bagous rotundatus</i></b> group	45
<b><i>Bagous rotundatus</i></b> O'Brien & Morimoto	45
<b><i>Bagous transversus</i></b> group	47
<b><i>Bagous youngi</i></b> O'Brien & Morimoto	48
<b><i>Bagous frit</i></b> group	51
<b><i>Bagous fritodes</i></b> O'Brien & Morimoto	51
<b><i>Species not assigned to group</i></b>	54
<b><i>Bagous lewisi</i></b> O'Brien & Morimoto	54
<b><i>Bagous subvittatus</i></b> O'Brien & Morimoto	57
<b><i>Bagous tuberculosus</i></b> O'Brien & Morimoto	59
Acknowledgments	62
References Cited	62

## INTRODUCTION

The *Bagous* of Japan have not been studied since the two hitherto known species were described by Chûjô & Morimoto (1959) and Kôno (1934). Interest in systematics of this large genus has increased because of their use in biological control, but it has not been possible to reliably identify most specimens from most zoogeographic regions. The species of Australia recently were treated by O'Brien & Askevold (1992), including phylogenetic analysis of the known members of this fauna. The methodology and data base of this systematic treatment provided a broad foundation for subsequent phylogenetic studies and classification of the *Bagous* of other regions.

The faunal study of Japanese *Bagous* was particularly difficult and illustrates well the nature of work on this genus that needs to be carried out on a world wide basis. There is a high proportion of undescribed species, which are almost indistinguishable externally. As was true of the Australian species, there is here also a great deal of structural convergence. The external similarity of species makes it necessary to dissect almost every specimen to verify determination. This problem is illustrated by the fact that the syntypal series of *B. kagiashi* Chûjô & Morimoto contained two species.

The purpose of the present study of *Bagous* is to systematically treat the members known to occur in Japan, and is the second of several such studies on this genus. The phylogenetic treatment on which the classification presented here is based follows Askevold et al. (1994).

## MATERIALS AND METHODS

## MATERIALS.

This study is based on examination of 188 adult specimens of *Bagous*, which are preserved in the museums and collections referred to in the text; the following codens are used according to recommendations of Heppner and Lamas (1982) and Amett and Samuelson (1969):

BMNH. Department of Entomology, The Natural History Museum, Cromwell Road, London, England. SW7 5BD (Richard Thompson).

BPBM. Department of Entomology, Bernice P. Bishop Museum, Box 19000-A, Honolulu, HI 968171 (G. Allan Samuelson).

CMNC. Canadian Museum of Nature, P.O. Box 3443, Station D, Ottawa, ON K1P 6P4 CANADA (Robert A. Anderson).

CWOB. Charles W. O'Brien collection, Entomology-Biological Control, Florida A. & M. University, Tallahassee, FL 32307-2926 (Charles W. O'Brien).

FSCA. Florida State Collection of Arthropods, Department of Entomology, Division of Plant Industry, P.O. Box 147100, Gainesville, FL 32614-7100 (Michael Thomas).

HAHC. Henry and Anne Howden collection, Department of Biology, Carleton University, Ottawa, Ont, Canada, K1S5B6 (Anne Howden).

KU. Entomology Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka 812 Japan (Katsura Morimoto).

MNHN. Entomologie, Muséum National d'Histoire Naturelle, 45, rue de Buffon, F-75005 Paris, France (Hélène Pen-in).

MWA. Polska Akademia Nauk, Instytut Zoologii, ul. Wilcza 62, 00679 Warszawa, Poland (Marek Wanat).

USNM. National Museum of Natural History, NHB 168, Washington, DC 20560 (James K. Pakaluk).

## **METHODS,**

### **Description of species.**

Descriptions of species were prepared with the aid of the computer program DELTA (Dallwitz and Paine, 1986; Partridge et al., 1988) (release 28 October, 1992). Uniformity of wording and presentation was guaranteed through use of this program. The format and wording of descriptions is constrained by DELTA and the way the data set must be prepared. Therefore, the precise construction of descriptions departs somewhat from the traditional taxonomic style. Punctuation must be observed carefully in order correctly to interpret series of attributes. The data base used in preparation of this monograph continues to grow as other faunal regions are studied (Askevold and O'Brien, 1994).

### **Recognition of species groups.**

Reference is made to species groups in discussion of characters below. These groups are recognized despite lack of a reconstructed phylogeny of all *Bagous* because more than one-half of the described world species have been studied and we are confident that they are phylogenetically well-founded. Criteria used to name species groups are discussed in detail in the accompanying phylogenetic treatment (Askevold et al., 1994).

### **Measurements.**

Measurements were made with an ocular micrometer in either a Wild M8 or a Leitz stereoscopic microscope. Body length was measured from the anterior margin of the prothorax along the midline to the apex of the elytra. Range in length was determined by visually selecting samples of the largest and smallest available specimens. Length of the prothorax was measured along the midline from apex to base; width was measured transversely at the widest point. The rostrum was measured in lateral view from the apex (excluding mandibles) to the base, where the dorsal margin of the scrobe reaches the eye or would reach the eye if continued in those species with scrobe not reaching the eye. The antennal insertion was measured in lateral view from the apex (excluding mandibles) to the point of insertion of the base of the scape. The frons is measured between the eyes at the midpoint of the margin of the eye seen in a frontal view. The length of each abdominal sternum was measured along the midline from base to apex. The median lobe was measured from the apex to the point of attachment of apodemes.

SELECTED GENITAL STRUCTURES USED IN CLASSIFICATION OF *BAGOUS*

Certain genital structures are described and discussed below. Certain terms are newly coined while we use other conventional terms in a very strict or narrow sense. It is important to understand the meaning of these terms as defined here to aid in identification, and phylogenetic analysis in particular. Characters used are mostly those of the median lobe and internal sac of the male, and of the eighth sternite of female genitalia. The spermatheca and gonocoxa, and to a much lesser extent tergum VIII and the pygidium, are useful for separation of species as well as for phylogenetic analysis.

Terminology of female genitalia follows, as much as possible, that of Lindroth (1957). Terms used for male genitalia follow O'Brien and Askevold (1992).

*Male genitalia:*

**Apodemes** (*cf.* Figs. 41, apd). The apodemes are measured from the point of attachment on the tube of the median lobe, **laterally** on the ventral margin to their base. The lengths of both apodeme and median lobe are measured from this point of attachment (*cf.* Fig. 41, poa).

**Basal plate** (*cf.* Figs. 42, 44, 45, bp). The ventral, basal margin of the median lobe, located approximately directly below the dorsal basal margin, usually is not visible from above. In some species, however, the ventral surface extends proximally, between the apodemes, and is therefore visible from above as a distinct plate (*cf.* many members of *B. bipunctatus* group).

**Denticles** (*cf.* Figs. 47, 49, 50 d, 55). Denticles are present in three locations on the median lobe. A few species have distinct, distally projecting denticles on the lateral margin of the median lobe, **distad** of the dorsal process (e.g., *B. fritodes*, *B. youngi*); these are just discernable with a dissecting microscope, and are best seen from above. Second, a few species also have denticles present on the dorsal process, on what appears to be the internal surface in cases where the dorsal surface of the dorsal process is open (e.g. *B. youngi*, *B. fritodes*, *B. rotundatus*). Third, the internal sac is typically covered with denticles of varying sizes and shapes, and in some species are of different sizes, shapes and densities at particular locations on the internal sac (e.g., the *B. bipunctatus* group).

**Dorsal process** (*cf.* Figs. 48-49, dp). The median lobe of many species of *Bagous* has a process which projects dorsally from the posterolateral margin of the orifice, and conceals the orifice, at least in part. It is fused directly to the median lobe, and is not capable of rotation or longitudinal articulation. Typically, the dorsal process is erect, projecting slightly proximally to slightly distally, the direction being characteristic of species, but in two small groups it projects horizontally (*B. trapae* group and *B. proprius* group).

**Median lobe**. As traditionally used the term median lobe refers to structures of the male external genitalia including the apodemes, internal sac and apical tubular portion. For ease of discussion here, median lobe is used only in reference to the completely tubular region, from which the paired apodemes arise. The median lobe is measured according to Fig. 41, mll.

**Orificial margins** (*cf.* Fig. 41, 43, dom, porn). Two orificial margins are recognized, the distal (dom) and proximal (porn) margins. Their discrimination is important in determining details of structure. The distal margin is generally fairly distinct. However, the proximal margin is generally indistinct because it is typically membranous and is the point at which the internal sac invaginates. In some species this margin is distinct and gives rise to a prominent dorsal sac-supporting sclerite. Among species with a dorsal process, the proximal margin is concealed.

**Orificial sclerites** (*cf.* Figs. 45, os). A pair of sclerites may be situated in the apical orifice of the median lobe (they may be very pale if the specimen is teneral or over-cleared). These are distinct sclerites, not merely areas of concentrations of spicules or denticles that may appear like sclerotized areas at low magnification, often found in many groups of weevils. These orificial sclerites evert with the sac and form a basal sac-supporting structure.

**Pseudo-orifice** (*cf.* Figs. 40, 44-45, pso). This is an area of diminished sclerotization of the median lobe immediately behind the orifice or orificial area. This relatively clear area is found in a large group of Australian species, several Japanese species, and in some other unrelated groups of species not under consideration here. This apparent, large orifice may be fairly distinctly defined toward the base of the median lobe, but this is not the true orificial margin. The true posterior orificial margin (Figs. 41, 43, pom) is the point of invagination of the internal sac, and in groups of species having a large, poorly sclerotized area this point of invagination often is visible only with a compound microscope.

**Setal brush** (*cf.* Figs. 47-49, 55, msb). In all species studied that have a dorsal process of the median lobe (except *B. proprius* and one undescribed Indian species), there is an associated brush of dense, long setae, which generally projects medially. Like many median lobe characters, it is seen well only at high magnification, using a compound microscope.

### ***Female genitalia:***

**Arms of Sternum VIII** (*cf.* Fig. 54, arm). This denotes an area, usually paired, of greater sclerotization of the plate of sternum VIII. The arms usually have setae or at least small sensilla apically. Basally, they broadly contact the apices of the apodemes, and may even extend between the apices of the apodemes. The arms are usually separate, leaving an "open" area between them which we call the fenestra (Fig. 51, 53, 57, fn). The arms are "closed" if they are fused apically (e.g. Figs. 51, 53, 57). In a very few species, the arms are nearly or completely fused, forming a broad, spatulate organ (e.g. *B. natator* and some species from India).

The shape of the lateral and/or medial (inner) margins of the arms is useful in grouping taxa and identifying species. The outer margin may be normal (arcuate, e.g. Fig. 51) or emarginate (e.g. Figs. 58-59, 62-63). The inner margin may be normal (arcuate, e.g. Figs. 51, 61, 63), parallel (Figs. 52, 54, 62), divergent (Figs. 58-59, 66), or convergent (Fig. 60). In the parallel, divergent and convergent forms, the inner margin is rather straight, contrasting with the arcuate form in which the arms apically, arcuately converge.

**Apodemes of Sternum VIII** (*cf.* Fig. 54, apd). This apodeme usually is recognized as a single, rod-like structure for muscle attachment. O'Brien and Askevold (1992) considered it a paired structure consisting of a pair of scleritic rods that are connected medially by a less heavily sclerotized area, because optically it has this appearance. Lyal (personal communication, 1992) suggested the apodeme is a cylindrical structure, which gives the appearance of being paired. This is a question that should be studied histologically, but for present purposes is of little consequence because the usefulness of characters is not affected.

The base of the apodemes is the proximal end where muscles attach; the apex is the distal end, which is limited by a broadly curved, suture-like line of contact with the arms. The apodemes are described as *narrowly separated* to their base if *two* suture-like lines are visible to the base (e.g. Figs. 52, 54), but are termed *contiguous* when only one suture-like line is visible between them (Figs. 57, 61). Apodemes may be very slightly divergent apically (e.g. Figs. 57, 61), or broadly divergent (e.g. Figs. 51, 54, 58-59), depending on the extent to which their

curved, suture-like line extends laterad and how widely they are separated. Thus, in **some** species, the apodemes are markedly divergent apically and give the sternum a broad appearance at low magnification (e.g. Figs. 54, 58, 65-66), while in others the apodemes are markedly cleft basad, appearing to be attached only narrowly, to varying degrees (e.g. even more so than Fig. 54). Exceptionally the apodemes are fully cleft, completely separate, and attached laterally on the sternum (non-Japanese, *B. crispus* group). Divergence, cleavage and amount of contiguous contact are useful in distinguishing species.

**Fenestra of Sternum VIII** (cf. Figs. 51, 53, fn). This is the area of lesser sclerotization between the arms of the sternum. To varying degrees, these enclose a window-like area which may even appear like a hole in some species, in which the arms are apically fused (Figs. 51, 53, 57). The size and shape of this fenestral area are useful in separating species.

**Gonocoxa** (cf. Fig. 54, gc). The gonocoxa is typical for weevils. In most species of *Bagous* it is almost cylindrical and about 2-3 times as long as wide; in *B. buckinghami*, however, the gonocoxa is elongate, slender, and sinuate (Fig. 52). A few small apical setae are present in some species, but these are generally not visible except at high magnification (Fig. 64). The stylus attaches apicolaterally and is small but distinct. In a few species the stylus is apparently absent (e.g. *B. buckinghami*). The gonocoxa consists of a dorsal surface and ventral surface, joined laterally but "open" medially. The ventral surface is generally complete, while the **dorsal** surface may be complete to almost absent; the amount of dorsal surface that is present is reflected in figures by the amount of darkened area. In extremely small species (e.g. *B. pygmaeus* group), the gonocoxa may be so small that some characters are not visible except with high magnification.

**Pygidium**. (cf. Fig. 56, Pm). In most females of *Bagous* the pygidium is essentially of the same shape, being very slightly and broadly emarginate. Exceptionally, the apex is very deeply emarginate (Fig. 56).

**Spermatheca** (cf. Fig. 51). The spermatheca is comprised of the body (B), nodulus (N), ramus (R), spermathecal duct (sd), and spermathecal gland (sg). Several characters are useful in identification: form of the nodulus (e.g. *B. bipunctatus* vs. *B. buckinghami* vs. *B. youngi*); length of the ramus in relation to the point of spermathecal duct insertion (e.g. long or distinct in *B. buckinghami*, vs. very short in *B. ryukyuensis*); amount of emargination separating the ramus from the body (cf. *B. proprius* vs. *B. ryukyuensis* vs. *B. lewisi*). We did not observe any convolution of the spermathecal duct, as found in some weevils.

**Tergum VIII** (cf. Fig. 56, T8). A number of characters of tergum VIII are useful in identification, but none of these have been used yet in phylogenetic study. In what appear to be the more primitive groups, the entire tergum is more or less hemispherical and featureless. The apical margin (Fig. 56, am) may be not at all raised, varying to very distinctly raised, forming a carina (best seen in lateral view). The apicolateral surface is generally convex, but varies to slightly swollen or even angulately projecting (as in Fig. 56, ala). Laterally, the margin may vary from not at all inflexed ventrally, to being markedly inflexed, curving underneath (Fig. 56, vli). The more highly derived taxa (e.g. male genitalia, with a dorsal process) appear to possess all of the characters seen in *B. fritodes*, which is an extreme example.

TAXONOMIC TREATMENT OF *BAGOUS*.*Bagous* Germar.*Bagous* Germar (1817:340).

Type species. *Rhynchaenus binodulus* Gyllenhal, by subsequent designation, Schönherr (1826:290).

GENERIC DESCRIPTION OF *BAGOUS*.

DIAGNOSIS. Japanese species of *Bagous* can be distinguished from other genera of Curculionidae by the following diagnostic characters: granulate to subgranulate, pitted scales, not hydrofuge except at points of articulation; usually with distinct, often dense, waterproof coating (lacking only in specimens recently emerged from pupal cell); median prosternal sulcus in front of forecoxae weakly developed to well-developed; tibiae usually slender, ventrally sinuate to bisinuate; tibial uncus well-developed; tarsomere 3 subcordate (Fig. 36) to linear (Fig. 37), not deeply bilobed; rostrum with antennae inserted laterally. Genitalia: median lobe of male dorsally fully sclerotized except in orificial area; median lobe ventrally fully sclerotized (except *B. kagiashi*); with or without post-orificial dorsal process; apodemes long and slender or very short, robust and curved inward; there are no diagnostic characters of female genitalia.

REDESCRIPTION. Body very small to large (length, 1.20-6.70 mm); usually elongate-oval, also short broad-oval to elongate-cylindrical, robust to slender; declivital callus of elytra various in size and shape, rarely absent; densely clothed with scales, usually granulate and pitted, rarely smooth with fine to obsolete pit; with waterproof coating, from clear and shellac-like to dense and subopaque, latter often concealing scales, color pattern and cuticle.

Rostrum usually shorter than pronotum, occasionally subequal in length or longer; often evenly or unevenly curved with apex depressed, rarely straight; subcylindrical to rounded; usually densely clothed with scales, at least in basal 1/2, apically often subglabrous; usually sides expanding to apex. Head usually weakly to strongly convex, occasionally obliquely flattened; densely clothed with subcontiguous, contiguous or imbricate scales, at times hydrofuge on vertex, genae and along margin of eye; frons variable, nearly contiguous to very broad, convex to broadly deeply impressed, often medially sulcate or foveate, often swollen beside margin of eye, occasionally subcarinate there, usually with subrecumbent to erect setae there, often scalelike, setae occasionally absent. Antennae usually inserted subapically, ca. 1/4 to 1/3 distance from apex of rostrum, occasionally near middle, and rarely subbasally, ca. 1/3 from base; scape elongate, resting in deep scrobe, reaching eye; funicle 7 segmented; club 3 segmented, usually annulate and densely pubescent, rarely with 1st segment glabrous and elongate. Prothorax usually transverse, broader than long, occasionally subequal in length and width or longer than broad; disc usually flattened, though occasionally undulate or rugose, rarely convex, usually with longitudinal median groove, latter sometimes interrupted, forming one or two impressions or rarely absent completely; scale covering usually dense; occasionally with scattered evident subrecumbent to suberect scalelike setae, these usually not visible. Scutellum visible, small to moderately large, usually round, clothed usually with dense hydrofuge scales, sometimes coated and even concealed by dense waterproof coating. Elytra with well-developed humeri, usually

obliquely **angulate**, occasionally acutely produced or subquadrately rounded; usually markedly wider than prothorax, occasionally subequal in width to prothorax; intervals usually flat to weakly convex, often with odd numbered intervals (especially 3, 5 and 7) more convex and more elevated, rarely all intervals markedly convex; usually only odd numbered intervals with row of recumbent to **suberect** small setae, these occasionally scale-like and very large; interval 3 often with antedeclivital swelling or tuberculate callus; interval 5 usually with evident declivital callus, various in shape and size, usually subquadrate, occasionally rounded or strongly acute, rarely absent; **striae** usually distinct, with punctures evident in bottom of groove; rarely not striate, but with large **strial** punctures often concealed (at least in part) by waterproof coating. Prosternum usually with distinct broad median shallow to deep sulcus in front of coxae, usually also with evident rounded to acute longitudinal ridge in front of coxae, rarely sulcus and ridge absent. **Abdominal sterna** various in length, sterna 1 and 2 elongate, 3 and 4 very short and 5 moderately short to long; sterna 1 usually medially impressed (at least in part) in male, and usually flat to convex in female; sterna 5 with 1 to several pairs of subapical, lateral, **suberect** to **erect**, usually coarse setae. Legs short to long; femora usually symmetrically, weakly to strongly clavate, always unarmed, tibiae usually sinuate to bisinuate occasionally straight, usually inwardly curved near **apex**; inner tibial margin often with denticles, latter sometimes stout, each denticle with **suberect** seta, rarely with single large submedian spur; inner tibial margin usually with short to long, curved to straight bristles (or fine setae), occasionally with very long fine, erect to adpressed, swimming hairs; tarsomeres various in length and shape, short to long, usually sublinear to linear, occasionally subcordate, especially tarsomere 3, latter sometimes emarginate but never deeply bilobed; venter of tarsomeres usually with moderately dense subrecumbent pubescence, usually most evident on tarsomere 3, rarely subglabrous with only sparse long setae; tarsal claws usually long and thin, always free and divergent.

**Genitalia and associated structures. Male.** Median lobe with dorsal (except orificial area) and ventral surfaces fully sclerotized, rarely membranous; many species with post-orificial, highly complex, laterally attached, dorsal process; apodemes attached at ventrolateral basal angle, very short to 1.5 times as long as median lobe; internal sac simple and spiculate, or with complex sclerites. **Female.** Female genital characters are typical of weevils in general.

#### PLACEMENT OF *BAGOUS* WITHIN CURCULXONIDAE.

Previously, it was suggested that *Bagous* probably belonged in the the Rhytirrhinae near *Listronotus*, not in the Eirrhinae where it has traditionally been placed (O'Brien & Askevold, 1992). This was concluded in part because *Bagous* has characters that do not permit placement in the Eirrhinae, including possession of complex, highly advanced genitalia. Its inclusion near *Listronotus* was based primarily on external morphology, which we now believe to be due to convergence. Differences in genitalia preclude its placement in the Listroderini, Rhytirrhinae. Based upon similarity in characters of genitalia and tibial structure, we now think that *Bagous* belongs in the Molytinae. Clearly, this question requires further study, especially since we can not determine a sister group at this time.

KEY TO JAPANESE SPECIES OF *BAGOUS*.

- Elytra lacking declivital callus on 5th interval; elytral scales arranged in regular pairs on each interval; body length usually less than 2.00 mm., at most 2.10 mm. . . 2
- 1' Elytra with small to large declivital callus on 5th interval; elytral scales more numerous, densely and irregularly arranged on each interval; body length greater than 2.00 mm., usually more than 2.30 mm. . . . . 3
- 2(1) Antennae inserted just behind apical 1/4 of rostrum; elytra with transverse broad white fascia surrounding brown to black large declivital macula . . . . .
- . . . . . *pygmaeodes* O'Brien & Morimoto, new species
- 2' Antennae inserted just behind apical 2/5 of rostrum; elytra with transverse short broad antedecrivital white fascia, and oblique post humeral white fascia, and scattered white maculae . . . . . *minor* O'Brien & Morimoto, new species
- 3(1') Antedecrivital swelling of 3rd elytral interval strongly tuberculate ...
- . . . . . *tuberculosis* O'Brien & Morimoto, new species
- 3' Antedecrivital swelling of 3rd elytral interval lacking or very weakly developed, not tuberculate . . . . . 4
- 4(3') Tarsi long, tarsomere 3 linear (Fig. 37); antennae inserted just in front of middle of rostrum; scape moderately short; elytra usually lacking vittae or maculae ...
- . . . . . *huckinghami* O'Brien & Morimoto, new species
- 4' Tarsi short to moderately 'long,' tarsomere 3 sublinear to subcordate (Figs. 36, 38); antennae inserted subapically, always well in front of middle of rostrum; scape usually moderately long to long; elytra with pale vittae and/or maculae ... 5
- 5(4') Tarsomere 3 broadly cordate, apex rather deeply emarginate; body robust to very robust; body length usually greater than 3.10 mm. . . 6
- 5' Tarsomere 3 subcordate to sublinear, apex slightly emarginate to truncate; body moderately robust to moderately slender; body length usually less than 3.00 mm. 7
- 6(5) Funicle long, 0.95 as long as scape; declivital callus of 5th elytral interval well-developed; cuticle black . . . *bipunctatus* (Kôno)
- 6' Funicle short, 0.64 as long as scape; declivital callus of 5th elytral interval moderately developed; cuticle red . . . . . *ryukyuensis* O'Brien & Morimoto, new species
- 7(5') Tarsomere 3 subcordate (Fig. 36) . . . . . 8
- 7' Tarsomere 3 sublinear (Fig. 38) . . . . . 11
- 8(7) Basal margin of pronotum lacking carina; frons with median fovea . 9
- 8' Basal margin of pronotum with indistinct to distinct carina in median 1/2 to 1/3; frons with median sulcus . . . . . 10
- 9(8) Rostrum of male and female longer than prothorax (1.07); ventral margin of rostrum distinctly carinate; declivital callus of 5th elytral interval weakly developed, subangulate . . . . . *spiculatus* O'Brien & Morimoto, new species
- 9' Rostrum of female (male unknown) shorter than prothorax (0.89); ventral margin of rostrum subcarinate; declivital callus of 5th elytral interval well-developed, subquadrate . . . . . *lewisi* O'Brien & Morimoto, new species

- 10(8') Basal margin of pronotum with distinct carina in median 1/2; antedeclivital swelling of 3rd interval weakly developed, but evident; sternum 5 with two pairs of apicolateral setae ..... *kugiashi* Chûjô & Morimoto
- 10' Basal margin of pronotum with indistinct carina in median 1/3; antedeclivital swelling of interval 3 lacking; sternum 5 with one pair of apicolateral setae ..... *subcordatus* O'Brien & Morimoto, new species
- 11(7') Rostrum with apical median carina well-developed; frons not sulcate nor foveate medially; abdominal sternum 2 not apically declivous; abdominal sterna with punctures moderate in size ... *occultus* O'Brien & Morimoto, new species
- 11' Rostrum lacking apical median carina; frons with median sulcus or fovea; abdominal sternum 2 apically declivous; abdominal sterna with small punctures ..... 12
- 12(11') Pronotum with indistinct transverse carina in median 1/2 of basal margin; antedeclivital swelling of 3rd elytral interval weakly-developed, but evident; sternum 5 basally, transversely subcostate; elytral striae with shallow punctures ..... *proprius* O'Brien & Morimoto, new species
- 12' Pronotum lacking transverse carina or with strong transverse carina in median 3/5 of basal margin; lacking antedeclivital swelling on 3rd elytral interval; sternum 5 basally, transversely convex or flat; elytral striae with deep punctures . 13
- 13(12') Pronotum with strong transverse carina in median 3/5 of basal margin; frons with moderately deep, narrow, median sulcus; suture straight between abdominal sterna 1 and 2 .... *subvittatus* O'Brien & Morimoto, new species
- 13' Pronotum lacking transverse carina on basal margin; frons with median fovea; suture bisinuate between abdominal sterna 1 and 2 ..... 14
- 14(13') Abdominal sternum 2 with multiple rows of evident subrecumbent coarse setae; frons very broad, ca. 0.70 as wide as head across eyes; elytra with declivity at 45 degrees (in relation to dorsal plane) ..... *youngi* O'Brien & Morimoto, new species
- 14' Abdominal sternum 2 with single row of scarcely evident subrecumbent coarse setae (abraded in *rotundatus*); frons broad, ca. 0.65 as wide as head across eyes; elytra with declivity at 60 to 75 degrees (in relation to dorsal plane) 1 5
- 15(14') Prosternal sulcus with lateral margin subacute just in front of coxae; head lacking swelling beside eye, with supraocular setae in cluster near eye; rostrum with ventral margin not angulate nor carinate ..... *rotundatus* O'Brien & Morimoto, new species
- 15' Prosternal sulcus with lateral margin rounded just in front of coxae; head with weak swelling beside eye with supraocular setae linearly arranged near eye; rostrum with ventral margin subangulate, not carinate . . . . . 16
- 16(15') Antennae inserted just behind apical 1/4 of rostrum in males; elytra with declivity at 75 degrees (in relation to dorsal plane); sternum 5 basally transversely convex; length of tibial uncus subequal to width of tibial apex . . . . . *fritodes* O'Brien & Morimoto, new species
- 16' Antennae inserted at apical 1/3 of rostrum in males; elytra with declivity at 60 degrees (in relation to dorsal plane); sternum 5 basally flat; length of tibial uncus shorter than width of tibial apex ... *fractus* O'Brien & Morimoto, new species

TAXONOMIC TREATMENT OF JAPANESE SPECIES OF *BAGOVS*.

Species are arranged phylogenetically, by species group, and by species within each group, in accordance with postulated relationships (*cf.* Askevold et **al.**, 1994).

*Bagous pygmaeus* group.

This species group is characterized by: very small size, usually 2.0 mm or less in length, short and broadly oval shape; greatly shortened caudal area of the elytra and lack of elytral callosities (Figs. 1-4); lack of pronotal median sulcus; very poorly developed, shallow prosternal sulcus that lacks lateral margins; relatively long rostrum of females, with antennae inserted at about midlength (most species); elytral scales arranged in pairs on all intervals; elytral humeri subquadrately rounded; tibiae with apices only slightly arcuate, lacking distinct denticles and with setae very short and indistinct; tarsi short, with tarsomere 3 broad and slightly cordate, tarsomere 3 clothed beneath with fine, dense, recumbent pubescence; median lobe with apodemes of moderate length and internal sac lacking sclerites.

This group presently includes at least nine species, of which only two are Japanese. Other described species known to belong to this group are *B. pygmaeus* Voss (Sumatra), for which the group is named, *B. clarenciensis* Blackburn (Australia) and *B. nodieri* Hustache (Vietnam). One species from China and at least 3 species from India and Pakistan are also known, all of which are undescribed. All known host records (actually reared from the plants) are from water fern, *Azolla* (Salviniaceae); it appears this group of species is adapted to this plant genus.

*Bagous minor* O'Brien & Morimoto, new species.

Figures 1-2, 39, 61.

**DESCRIPTION -- Holotype male.** -- Body medium sized, moderately broad-oval, moderately robust. Rostrum long, 1.00 as long as prothorax; black, with apex reddish brown; subcylindrical; with dorsal curvature moderate and uneven; with ventral curvature moderate and even; moderately depressed in apical 1/3; with median basal carina lacking; with apical median carina lacking; with basolateral sulcus deep, broad, long, coarsely punctate; with ventral margin angulate, subcarinate; with sides unevenly subparallel, evenly, not quadrately expanding from just behind antennal insertion to apex; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales dense in basal 2/3, subgranulate, contiguous, pitted, round, whitish, more coarsely subgranulate and pitted basally, sparser apically, denuded, not contiguous, finely pitted, round, not metallic; without numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; coarsely densely punctate, with punctures becoming sparser and finer apically. Head weakly convex; with swelling beside eye lacking; with eyes moderately convex; with scales nongranulate, imbricate, finely pitted, round, grey-brown and white; with plumose scales whitish, on articulating area. Supraocular setae few, long, distinct, suberect, curved, slender, seta like,

linearly arranged. Frons without submedian setae; broad, 0.58 as wide as head across eyes, somewhat flattened, not impressed, indistinctly set off from rostrum by shallow impression; not sulcate nor foveate medially. **Antennae** inserted just behind apical 1/4, inserted laterally; scape long, slender, subclavate; scape and funicle reddish brown; funicle moderately short, 0.73 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club long, broad-oval, 0.63 as long as funicle, reddish black. **Pronotum** transverse, 0.87 as long as broad; with sides unevenly subparallel, very weakly expanding from base; with apical constriction moderate, in apical 1/4, dorsally distinct and uniform, weakly rounded behind constriction, with sides not impressed somewhat behind constriction; with median sulcus lacking; with disc transversely weakly convex, not undulate, not rugose or rugulose; with apical and marginal setae lacking; with carina of basal margin lacking; with scales subgranulate, pitted, imbricate, round, black; with 3 vittae, with median vitta moderately broad, complete, distinct, uneven, whitish; with lateral vitta broad, uneven, whitish; not maculate on disc; with sides broadly whitish, with indefinite blackish brown maculae; with ocular lobes weakly developed, reddish brown. **Prosternal sulcus** moderately deep, broad, strongly narrowed at apical constriction, biangulate; with side margins moderately raised, with lateral margin just in front of coxae (lateral view) rounded. **Elytra** subparallel behind humeri to declivity, with declivity at 60 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices nonacuminate, conjointly slightly emarginate; with humeri well-developed, with humeri non-acute, weakly rounded, not at all projecting; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals very slightly more convex and elevated, not broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae inconspicuous, suberect, curled, coarse, pale whitish, each surrounded by scales of same color as other scales; even numbered intervals weakly convex to flat, interval 2 not impressed; disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedeclivital swelling of 3rd interval lacking; declivital callus of 5th interval lacking; confluence of intervals 3 and 9 slightly swollen; striae grooves indistinct, shallow, narrow, with punctures minute, scarcely evident, round, narrow, deep, not wider than striae grooves; scales subgranulate, imbricate, finely pitted, round, arranged in rows of regular pairs on intervals, black, brown, and white; fasciate-maculate; humeri with moderately large white macula; antedeclivital callus or area of interval 3 with white macula; declivital callus or area of interval 5 without macula; otherwise with transverse antedeclivital white fascia, oblique white posthumeral fasciae and scattered white maculae on black to dark brown base color; cuticle black. **Abdominal sterna** with punctures small. Sternum 1 with median impression in basal 1/2 only, very shallow, broad; flattened in apical 1/2; apical margin not declivous, 1.43 as long as 2; suture between 1 & 2 straight, finely incised medially, deep laterally. Sternum 2 flattened, with transverse row of scarcely evident (often denuded) subrecumbent coarse setae, not apically declivous, 1.27 as long as 3 & 4 together. Sternum 5 with pair of subbasal lateral impressions; with apicomedian area flat; basally flat; with lateral impressions very shallow, large; with one pair of apicolateral setae, with setae suberect, coarse, 1.27 as long as 3 & 4 together, 1.00 as long as 2, 0.55 as long as 1. **Legs** moderately short; femora subclavate, dark reddish. Tibiae moderately stout, reddish brown, with inner margin weakly bisinuate, with outer margin slightly arcuate toward apex (in lateral view); with apices distinctly narrowed; with inner surface with denticles few, indistinct, minute, with few inconspicuous bristles on inner surface, with bristles on outer surface lacking; with uncus long, moderately stout, longer than width of tibial apex; hind tibiae as strongly arcuate as fore-

and midtibiae, with denticles like fore- and midtibiae, with similar number of setae as fore- and mid-tibiae. **Tarsi** short, sublinear, reddish black, tarsomeres 1-3 broadened toward apex; tarsomere 3 distinctly wider at apex than 2, subcordate, subemarginate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally finely pubescent; claws yellowish. **Length**, pronotum and elytron: 1.90 mm.

*Allotype female.* Same as male except: **Length**, pronotum and elytra: 1.80 mm.

**Genitalia and associated structures.** -- **Male.** **Median lobe** with dorsal surface excluding orificial area, fully sclerotized; with ventral surface fully sclerotized; more or less parallel-sided; with extreme apex broadly and uniformly rounded, robust in lateral view, bluntly rounded; with dorsobasal margin distinct, shallowly emarginate; with ventrobasal margin not distinguishable; with dorsal surface behind orifice poorly sclerotized, orifice apparently elongate-oval (i.e., pseudo-orifice produced), with proximal margin of pseudo-orifice indistinct, with pseudo-orifice short, slightly enlarging apparent orifice. Orifice more or less oval; with proximal margin indistinct, not sclerotized. **Apodemes** long, 1.00 as long as median lobe. **Internal sac.** Orificial sclerites indistinct, subacute, pale, poorly sclerotized; internal sac with numerous coarse spicules. **Female.** **Sternum VIII** with apical setae numerous, very long, slender; arms broad, parallel, not apically fused, with inner margins broadly, shallowly arcuate, with outer margins broadly arcuate; fenestral area open, elongate-narrow. **Apodemes** moderately divergent near apex only, contiguous to base. **Spermatheca.** Ramus indistinct, not extending past insertion of spermathecal duct, with outline almost uniformly continuous with body. Nodulus slightly concave. **Gonocoxae** short, slender, with apex rounded, glabrous apically (or setae not distinguishable); with styli distinct, apicolaterally inserted. **Bursa copulatrix** simple, without sclerites. **Tergum VIII** rounded, hemispherical, not raised to form narrow marginal carina; apicolaterally not at all swollen, with lateral margins slightly inflexed ventrolaterally. **Pygidium** with apex truncate.

**Intraspecific Variation.** -- The base color of the thoracic and elytral scales ranges from black to brown, with various white maculations and vittae. The maculations are usually very dense and numerous, to very sparse and few in number. The odd numbered elytral intervals are usually slightly elevated, but occasionally are nearly flat or rather strongly elevated. Size range 1.60 - 2.10 mm. with only one specimen longer than 2.00 mm.

**Etymological Note.** -- This epithet is based on the Latin adjective *minor* (= smaller, lesser) and refers to the small size of this distinctive species.

**Remarks and Comparative Notes.** -- This small species should not be confused with any other, except possibly *B. pygmaeodes*. However, the latter is broader and distinctly short-oval, possesses indistinct shallow elytral striae, and normally has a less evident thinner waterproof coating that does not conceal the granulate coarsely pitted scales.

**Biological Note.** -- No data are available.

**Type Locality.** -- Japan, Honshu, Niigata Prefecture, Niitsu-shi.

**Notes on Type Specimen(s).** -- Holotype (by designation) male (dissected), with the following labels: 1) [rectangular; whitish; handprinted in black ink] Niitsuushi/ Niigata pref. 15.VIII.1965 S. Sakurai 2) [rectangular; yellow; printed in black ink] Property of Entomol. Lab., Kyushu Univ. 3) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1991 4) [rectangular; red; printed in black ink] HOLOTYPE Bagous minor O'Brien & Morimoto 1994. Point mounted. Deposited in Kyushu University, Fukuoka, Japan. Type number 2907.

**Range.** -- Honshu, Sado, Japan.

*Material Examined.* -- Holotype, allotype and 16 paratypes. [JAPAN: **Honshii:**] Niitsu-shi Niigata Pref. 8.VIII.1963 K. Baba (1, CWOB; **holotype**, KU), 15.VIII.1965 S. Sakurai (2, KU); Shibata-shi, Niigata Pref. 15.VIII.1965 K. Baba (1, KU). [**Sado:**] Sado Nakaoku 28.VIII.1963 K. Baba (1, KU). [VIETNAM:] Tonkin / CHO GANH L. DUPORT / riziér [?illegible] le soir à la lumibre / MUSEUM PARIS COLL E. FLEUTIAUX 1919 (1, MNHN); MUSEUM PARIS TONKIN SEPT. HA-LANG LAMEY 1898 (1, MNHN); Hoa Binh Tonkin de Coqman / MUSEUM PARIS 1955 Coll. A. CLERC (1, MNHN); MUSEUM PARIS TONKIN REG DE HOA BINH A DE COOMAN 1929 (5, MNHN); TONKIN REGION DE HOA-BINH / MUSEUM PARIS 193 A DE COOMAN (1, MNHN); TONKIN Hoa-Binh leg. A. de Cooman (**allotype**, MNHN, 2, MNHN); Vietnam, Phu Quy, distr. Nghe An 17.VI.1959 leg. B. Pisarski et J. Prószyński (1, MWA).

*Bagous pygmaeodes* O'Brien & Morimoto, new species.

Figures 3-4, 40, 60.

DESCRIPTION -- *Holotype male.* -- Body small, short-oval, moderately robust. **Rostrum** long, 1.00 as long as prothorax; black, with apex reddish brown; subcylindrical; with dorsal curvature moderate and uneven; with ventral curvature weak and uneven; moderately depressed in apical 1/2; with median basal carina lacking; with apical median carina lacking; with basolateral sulcus moderately developed, broad, short, coarsely punctate; with ventral margin subangulate, not carinate; with sides unevenly subparallel, evenly, not quadrately expanding from just behind antennal insertion to apex; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales sparse in basal 1/3, not granulate, subcontiguous, finely pitted, oval, metallic, more evidently pitted in basal 1/3, denuded, at least in part; without numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; with few coarse punctures, with punctures becoming sparser and finer apically. **Head** moderately convex; with swelling beside eye lacking; with eyes weakly convex; with scales granulate, contiguous, pitted, round, brownish black and white; with plumose scales whitish, on articulating area. Supraocular setae few, short, indistinct, suberect, curved, coarse, seta like, in cluster near eyes. Frons without submedian setae; broad, 0.64 as wide as head across eyes, weakly convex, not impressed, indistinctly set off from rostrum by shallow impression; not sulcate nor foveate medially. **Antennae** inserted at apical 2/5, inserted laterally; scape moderately long, moderately slender, subclavate; scape and funicle reddish brown; funicle long, 0.95 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club short, broad-oval, 0.45 as long as funicle, reddish black. **Pronotum** transverse, 0.81 as long as broad; with sides unevenly subparallel, very weakly expanding from base; with apical constriction moderate, in apical 1/4, dorsally distinct and uniform, weakly rounded behind constriction, with sides not impressed somewhat behind constriction; with median sulcus lacking; with disc transversely weakly convex, not undulate, not rugose or rugulose; with apical and marginal setae few, scarcely evident, very short, suberect, curved, coarse; with carina of basal margin lacking; with scales coarsely granulate and rugulose, pitted, subcontiguous, round, black; with 3 vittae, with median vitta broad, interrupted, distinct, uneven, whitish; with lateral vitta moderately broad, uneven,

whitish; not maculate on disc; with sides broadly whitish, with indefinite blackish brown maculae; with ocular lobes weakly developed, reddish brown. **Prosternal sulcus** moderately deep, broad, weakly narrowed at apical constriction, moderately biangulate; with side margins scarcely raised, with lateral margin just in front of **coxae** (lateral view) rounded. **Elytra** subparallel behind humeri to declivity, with declivity at 75 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices nonacuminate, conjointly slightly emarginate; with humeri well-developed, with humeri non-acute, weakly rounded, somewhat produced; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals very slightly more convex and elevated, not broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae inconspicuous, suberect, curled, coarse, pale, each surrounded by scales of same color as other scales; even numbered intervals weakly convex to flat, interval 2 not impressed; disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedeclivital swelling of 3rd interval lacking; declivital callus of 5th interval lacking; confluence of intervals 3 and 9 not swollen; striae distinct, deep, narrow, with punctures small, round, narrow, deep, not wider than striae grooves; scales subgranulate, contiguous, coarsely pitted, round, arranged in rows of regular pairs on intervals, black, brown, and white; fasciate-maculate; humeri with white macula; antedeclivital callus or area of interval 3 without macula; declivital callus or area of interval 5 without macula; otherwise with transverse broad antedeclivital whitish fascia curving posteriorly around dark (brown to black) large declivital macula, apex and sides whitish, and with scattered white maculae, on brownish black base color; cuticle reddish brown. **Abdominal sterna** with punctures small. Sternum 1 with median impression in basal 1/2 only, moderately shallow, broad; flattened in apical 1/2; apical margin not declivous; 1.31 as long as 2; suture between 1 & 2 sinuate, finely incised medially, deep laterally. Sternum 2 flattened, with transverse row of scarcely evident (often denuded) subrecumbent coarse setae, apical 1/10 declivous, not impressed on declivity, 1.30 as long as 3 & 4 together. Sternum 5 with median subapical and pair of subbasal lateral impressions; basally transversely convex; with median impression shallow, broad, transverse, without carinate margins; with lateral impressions very shallow, small, subequal to median impression in depth; with one pair of apicolateral setae, with setae suberect, coarse, 1.10 as long as 3 & 4 together, 0.85 as long as 2, 0.65 as long as 1. **Legs** moderately short; femora clavate, black, with basal half reddish brown. Tibiae moderately slender, reddish brown, with inner margin strongly bisinuate, with outer margin slightly arcuate toward apex (in lateral view); with apices not narrowed; with inner surface not denticulate, with few inconspicuous bristles on inner surface, with bristles on outer surface lacking; with uncus moderately short, moderately stout, subequal to width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with similar number of setae as fore- and mid-tibiae. Tarsi moderately short, sublinear, reddish black, tarsomeres 1-3 broadened toward apex; tarsomere 3 distinctly wider at apex than 2, subcordate, subemarginate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally finely pubescent; claws yellowish. **Length**, pronotum and elytron: 1.65 mm.

**Allotype female.** Same as male except: Rostrum with dorsal curvature weak and even, with ventral curvature weak and even. Sternum 1 1.31 as long as 2. **Length**, pronotum and elytra: 1.90 mm.

**Genitalia and associated structures.** -- **Male.** **Median lobe** markedly compressed, dorsoventrally flattened; with dorsal surface excluding orificial area, fully sclerotized; with ventral surface fully sclerotized; very slightly broader basally, not constricted behind orifice; with

extreme apex subtruncate, very bluntly rounded, slender in lateral view, tapering and narrowly rounded, with dorsobasal margin indistinct, shallowly emarginate; with ventrobasal margin not distinguishable; with dorsal surface behind orifice poorly sclerotized, orifice apparently elongate-oval (i.e., pseudo-orifice produced), with proximal margin of pseudo-orifice indistinct, with pseudo-orifice short, slightly enlarging apparent orifice. Orifice more or less oval; with proximal margin indistinct, not sclerotized. **Apodemes** long, 0.81 as long as median lobe. **Internal sac.** Orificial sclerites lacking and without internal structures. **Female. Sternum VIII** with apical setae numerous, long, slender; arms slender, slightly convergent, with inner margins more or less straight, with outer margins broadly, shallowly emarginate; fenestral area open, broad. **Apodemes** broadly divergent from apical 1/3, narrowly separated to base. **Spermatheca.** Ramus absent. Nodus more or less uniformly, slightly convex. **Gonocoxae** short, slender, more or less parallel-sided, slightly arcuate, with apex rounded, glabrous apically (or setae not distinguishable); with styli distinct, apically inserted. **Bursa copulatrix** simple, without sclerites. **Tergum VIII** rounded, almost hemispherical; with apical margin medially slightly truncate, not raised to form narrow marginal carina; apicolaterally not at all swollen, with lateral margins not at all inflexed ventrolaterally. **Pygidium** with apex truncate.

**Intraspecific Variation.** -- The cuticle ranges in color from red to black, with some individuals bicolored with the base and sides of the elytra and most of the venter black. Size range 1.65 - 1.90 mm.

**Etymological Note.** -- This epithet is based on the combination of *pygmaeus*, a similar Asian species of *Bagous*, and the suffix *-odes* (= like, resembling) and refers to the strong external resemblance of this species to *B. pygmaeus* Voss.

**Remarks and Comparative Notes.** -- This small species may be confused only with *B. minor*. However the latter appears less robust and more elongate-oval, and possesses distinct deep elytral striae. Also, normally it has a dense thick waterproof coating, which nearly conceals the subgranulate finely pitted scales.

**Biological Note.** -- **No** data are available, but this species is a member of the *Bagous pygmaeus* group and all members of this group for which hosts are known breed in and feed on water-fern, *Azolla*, Salviniaceae.

**Type Locality.** -- Japan, Shikoku, Jinzenji, Kochi City.

**Notes on Type Specimen(s).** -- Holotype (by designation) male (dissected), with the following labels: 1) [rectangular; white; printed in black ink] (Shikoku) Jinzenji Kochi City 23.vii.1953 K.Morimoto 2) [rectangular; yellow; printed in black ink] Property of Entomol. Lab., Kyushu Univ. 3) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1991 4) [rectangular; red; printed in black ink] HOLOTYPE *Bagous pygmaeodes* O'Brien & Morimoto 1994. Point mounted. Tarsi missing from left front and left middle legs. Left hind leg missing. Deposited in Kyushu University, Fukuoka, Japan. Type number 2908.

**Range.** -- Honshu, Kyūshū, Shikoku, Japan.

**Material Examined.** -- Holotype, allotype and 8 paratypes. [JAPAN: **Honshu:**] Tomiura Chiba Pref. 19.v. 1963 K. Baba (1, KU); [Kyūshū:] Roppon-matsu Fukuoka City 3.vii. 19.54 Col. H. Kamiya (1, KU); [Shikoku:] Shikoku Jinzenji Kochi City 23.vii.1953 (holotype and 2, KU), 30.VIII.1954 K. Morimoto (1, CWOB; 1, KU); (Shikoku) Ōmachi Mure-Mura Kita-Gun Kagawa Pref. 27.VI.1956 H. Toshima (1, CWOB; allotype and 1, KU).

### **Bagous bipunctatus group.**

This group is characterized by: pair of dense fields of spicules behind orifice (Figs. 41-45, sf) (however, in *B. occultus*, these spicules enlarged, reduced in number; *B. bipunctatus* similar but not so extreme); median lobe markedly widest at base, thence constricted to parallel sides (but in *B. occultus* and *B. bipunctatus*, and probably also *B. subcordatus*, median lobe quite parallel-sided (which we consider a reversal in order to best explain phylogenetic data); median lobe with basal plate between apodemes (Figs. 42, 44, 45, bp) (except *B. ryukyuensis* and *B. kagiashi*); spermatheca rather distinctly triangularly shaped, with nodulus somewhat produced (except *B. ryukyuensis*); lateral margin of arms of sternum VIII emarginate, producing rather triangular arms (except *B. ryukyuensis*).

It is postulated that some of these characters are highly modified in some of the included species, which further renders the group difficult to define. The postulated synapomorphy for the group consists of the dense field of spicules of the internal sac. Otherwise the group is heterogenous in external structure such as tarsal shape and tibial curvature and dentition. Notably, most of the included species have sublinear (but short to long) tarsi, but *B. subcordatus* and *B. bipunctatus* have broad subcordate tarsi. As we found previously in the *B. hydrillae* group (19 Australian species), it appears that species groups that contain large numbers of species will be found to show considerable homoplasy (including reversals and parallelisms) in external structure. We know that many extralimital taxa show the characters we postulate to be synapomorphic for the *B. bipunctatus* group (based on unpublished illustrations from R. Caldara). It is quite possible, therefore, that this group cannot be maintained as monophyletic as we study and analyze other faunas.

### ***Bagous ryukyuensis* O'Brien & Morimoto, new species.**

Figures 5-6, 43, 51.

**DESCRIPTION -- Holotype male.** -- Body medium sized, elongate broad-oval, very robust. Rostrum long, 1.09 as long as prothorax; reddish brown; subcylindrical; with dorsal curvature strong and even; with ventral curvature weak and even; not more distinctly depressed toward apex; with median basal carina lacking; with basolateral carina lacking; with apicolateral carina lacking; with apical median carina lacking; with basolateral sulcus scarcely evident, narrow, short, coarsely punctate; with ventral margin weakly subangulate, not carinate; with sides unevenly subparallel, weakly subquadrately expanded in apical 2/5; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales dense in basal 1/2, subgranulate, contiguous, coarsely pitted, oval, metallic, more coarsely subgranulate and pitted basally, becoming sparser in apical 1/2, nongranulate, not contiguous, finely pitted, oval, metallic; without numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; coarsely densely punctate, with punctures becoming sparser and finer apically. Head weakly convex; with swelling beside eye lacking; with eyes moderately convex; with scales subgranulate, contiguous, coarsely pitted, round, grey-brown and white; with plumose scales yellowish, on articulating area. Supraocular setae lacking. Frons without submedian setae; broad, 0.62 as wide as head across eyes, weakly convex, not impressed,

not set off from rostrum by impression; with median sulcus, sulcus deep, narrow, long. **Antennae** inserted just behind apical 1/3, inserted laterally; scape long, slender, subclavate; funicle reddish brown; funicle long, 0.95 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 **subequal** in length, 3-6 short, 7 short and strongly transverse; club short, **broad-oval**, 0.47 as long as funicle, reddish black. **Pronotum** transverse, 0.82 as long as broad; with sides subparallel, moderately expanding from base; with apical constriction moderate, in apical 1/8, without longitudinal carinae, dorsally shallower medially, moderately rounded behind constriction, with sides not impressed somewhat behind constriction, lacking pit near margin of prosternal sulcus; with median sulcus indistinct, very narrow, complete, of uniform depth and width or almost so; with disc transversely flattened, not undulate, not rugose or rugulose; with apical and marginal setae moderate in number, scarcely evident, very short, suberect, curved, fine; with carina of basal margin lacking; with scales subgranulate, coarsely pitted, contiguous, round, brownish; with 3 vittae, with median vitta narrow, complete, distinct, straight, whitish brown; with lateral vitta moderately broad, curved, pale whitish-brown; not maculate on disc; with sides whitish brown, with indefinite brownish maculae and vittae; with ocular lobes moderately developed, reddish brown. **Prosternal sulcus** moderately deep, broad, strongly narrowed at apical constriction, biangulate; with side margins moderately sharply raised, with lateral margin just in front of **coxae** (lateral view) rounded. **Elytra** subparallel behind humeri to declivity, with declivity at 60 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices subacuminate, conjointly slightly emarginate; with humeri well-developed, subangulately rounded, not at all projecting; with basal margin more or less flat, at most slightly swollen adjacent to **scutellum**; with odd intervals more convex and elevated, broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae inconspicuous, subrecumbent, curled, coarse, pale whitish, each surrounded by scales of same color as other scales; even numbered intervals unevenly flattened, interval 2 not impressed; disc not transversely angulately impressed across basal 1/3, disc not undulating; antedeclivital swelling of 3rd interval lacking; declivital callus of 5th interval well-developed, subangulate; confluence of intervals 3 and 9 distinctly swollen; striae distinct, moderately deep, narrow, with punctures small, round, narrow, deep, not wider than striae grooves; scales subgranulate, imbricate, coarsely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, brown, whitish and black; fasciate; humeri pale whitish brown; antedeclivital callus or area of interval 3 without macula; declivital callus or area of interval 5 without macula; otherwise with broad transverse antedeclivital sublunate whitish fascia extending anteriorly on intervals 4, 5 and 6 to basal 2/5 and with indefinite whitish and black maculae; cuticle reddish brown. **Abdominal sterna** with punctures moderate in size. Sternum 1 with median impression continuous for entire length, moderately shallow, broad, narrowed apically, not deeper apically, not continued on sternum 2, apical margin declivous, 1.21 as long as 2; suture between 1 & 2 bisinuate, narrowly fused medially, deep laterally. Sternum 2 flattened, with multiple transverse rows of evident (often denuded) subrecumbent coarse setae, apical margin moderately declivous, not impressed on declivity, 1.40 as long as 3 & 4 together. Sternum 5 with pair of subbasal lateral impressions; with apicomedian area flat; basally flat; without tubercles; with lateral impressions very shallow, small; with two pairs of apicolateral setae, with setae suberect, coarse, 1.00 as long as 3 & 4 together, 0.71 as long as 2, 0.59 as long as 1. **Legs** moderately long; femora clavate, reddish brown. Tibiae moderately slender, reddish brown, with inner margin weakly bisinuate, with outer margin slightly arcuate toward apex (in lateral view); with apices not narrowed; with inner

surface with denticles several, distinct, small, with numerous conspicuous short bristles on inner surface, with short, inconspicuous bristles on outer surface; with **uncus** moderately long, moderately stout, **subequal** to width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with 1 very small denticle, with 1 or 2 short setae on inner surface. **Tarsi** moderately short, broad, reddish brown, tarsomeres 1-3 broadened toward apex: tarsomere 3 distinctly wider at apex than 2, broadly **cordate**, rather deeply emarginate; tarsomeres ventrally with dense, erect pubescence, dorsally with coarse scalelike long setae; claws reddish brown. **Length**, pronotum and elytron: 3.05 mm.

**Allotype female.** Same as male except: **Rostrum** 1.16 as long as prothorax, subcylindrical, with dorsal curvature weak and even, not evidently subquadrately expanded apically. Frons moderately broad, 0.52 as wide as head across eyes. **Antennae** inserted at apical 2/5. Sternum 1 with median impression basal in basal 1/4 only, shallow, broad; convex in apical 3/4. Sternum 2 convex. Sternum 5 with pair of subbasal lateral impressions only, with apicomedian area weakly convex; with lateral impression shallow; small. **Length**, pronotum and elytra: 3.50 mm.

**Genitalia and associated structures.** -- **Male. Median lobe** with dorsal surface excluding orificial area, fully sclerotized; with ventral surface fully sclerotized; markedly broadest basally and constricted at extreme base, tapering toward apex; somewhat elongate, with extreme apex subacute, narrowly rounded, slightly subapically constricted, robust in lateral view, bluntly rounded; with dorsobasal margin not distinguishable; with ventrobasal margin distinct, truncate. Orifice more or less oval, short; with proximal margin distinct, markedly sclerotized. **Apodemes** long, 1.16 as long as median lobe. **Internal sac.** Orificial sclerites lacking; internal sac with numerous fine spicules and with pair of dense suborificial fields of spicules. **Female. Sternum VIII** with apical setae numerous, very short, slender, with few very short conical sensilla; arms very broad, apically convergent, apically narrowly fused, with inner margins broadly, deeply arcuate, with outer margins broadly arcuate; fenestral area closed, oval. **Apodemes** broadly divergent from apical 1/3, narrowly separated to basal 1/3. **Spermatheca.** Ramus indistinct, not extending past insertion of spermathecal duct, set off from body by shallow emargination. Nodulus more or less uniformly, slightly convex. **Gonocoxae** long, robust, tapering toward apex, with apex rounded, glabrous apically (or setae not distinguishable); with styli distinct, apicolaterally inserted. **Bursa copulatrix** simple, without sclerites. **Tergum VIII** rounded, almost hemispherical; with apical margin medially slightly truncate, very slightly reflexed but not forming distinct lip; apicolaterally not at all swollen, with lateral margins not at all inflexed ventrolaterally. **Pygidium** with apex truncate.

**Intraspecific Variation.** -- The cuticle ranges in color from red to blackish red. The antedecivital fascia is always broad, whitish and well-developed, but the marginal post-humeral lunate portion of the fascia is sometimes pale brown and indefinite. The median pronotal vitta may be complete or interrupted to form short, basal and apical, narrow vittae. Size range 3.05-3.50 mm.

**Etymological Note.** -- This epithet is formed from the name of the island from which the type series was collected plus the Latin suffix *-ensis* (indicating origin or place).

**Remarks and Comparative Notes.** -- This species might be confused with *B. youngi* and *B. bipunctatus* but the latter 2 species have a sublunate elytral fascia which is interrupted, at least on the sutural interval, and both possess large stout denticles on the tibiae.

**Biological Note.** -- Collected in a light trap.

**Type Locality.** -- Japan, Ryukyu Islands, Iriomote Jima [Island], Sonae.

**Notes on Type Specimen(s).** -- Holotype (by designation) male (dissected), with the following labels: 1) [rectangular; white; handprinted in black ink] Sonae Iriomote jima Isd. Ryukyu Isls. May 27, 1977 Coll. J. Okuma 2) [rectangular; white; handprinted in black ink] Light/ Trap 3) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1991 4) [rectangular; red; printed in black ink] HOLOTYPE *Bagous ryukyuensis* O'Brien & Morimoto 1994. Point mounted. Deposited in Kyushu University, Fukuoka, Japan. Type number 2909.

**Range.** -- Iriomote Jima, Ryukyu Islands, Japan.

**Material Examined.** -- Holotype, allotype and 3 paratypes. [JAPAN: Ryukyu Islands:] Sonae Iriomote jima Is. Ryukyu Isls. May 27, 1977 Coll. J. OKUMA / light trap (1, CWOB; holotype, allotype, 2, KU).

***Bagous kagiashi* Chûjô & Morimoto**

Figures 7-8, 41, 62.

***Bagous kagiashi* Chûjô & Morimoto (1959: 150).**

**REDESCRIPTION -- Mule.** -- Body medium sized, elongate-oval, moderately robust. Rostrum long, 1.02 as long as prothorax; black, with apex reddish brown; subcylindrical; with dorsal curvature strong and uneven; with ventral curvature weak and even; strongly depressed at antennal insertion; with median basal carina lacking; with apical median carina lacking; with basolateral sulcus deep, narrow, long, coarsely punctate; with ventral margin subangulate, subcarinate; with sides unevenly subparallel, weakly subquadrately expanded in apical 1/3; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales dense in basal 2/3, subgranulate, subcontiguous, pitted, round to oval, metallic, more coarsely subgranulate and pitted basally, sparser apically, nongranulate, subcontiguous, finely pitted, round, metallic; without numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; coarsely densely punctate, with punctures becoming sparser and finer apically. Head moderately convex; with swelling beside eye weak; with eyes moderately convex; with scales granulate, contiguous, coarsely pitted, round, brownish black and white; with plumose scales yellowish, on articulating area. Supraocular setae few, short, distinct, subrecumbent, curved, coarse, scale like, in cluster near eyes. Frons without submedian setae; broad, 0.63 as wide as head across eyes, somewhat flattened, indefinitely shallowly impressed, not set off from rostrum by impression; with median sulcus, sulcus moderately deep, narrow, short. Antennae inserted just in front of apical 1/3, inserted laterally; scape long, moderately slender, subclavate; scape and funicle dark reddish; funicle moderately short, 0.64 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club broad-oval, 0.61 as long as funicle, reddish black. Pronotum transverse, 0.93 as long as broad; with sides sinuately subparallel, very weakly expanding from base; with apical constriction moderate, in apical 1/6, dorsally distinct and uniform, weakly rounded behind constriction, with sides slightly impressed behind round area; with median sulcus distinct, narrow, complete, forming subbasal impression, with subbasal impression large, strong, deep; with disc transversely flattened, not undulate,

rugulose; with apical and marginal setae few, scarcely evident, short, suberect, curved, coarse; with **carina** of basal margin strong, in median 1/2; with scales coarsely granulate and rugulose, coarsely pitted, subcontiguous, round, black; with 3 vittae, with median vitta narrow, complete, distinct, straight, whitish; with lateral vitta narrow, obliquely angled, whitish; not maculate on disc; with sides broadly whitish, with indefinite blackish brown maculae; with ocular lobes moderately developed, reddish brown. **Prosternal sulcus** moderately deep, broad, strongly narrowed at apical constriction, biangulate; with side margins moderately sharply raised, with lateral margin just in front of coxae (lateral view) subacute. **Elytra** subparallel behind humeri to declivity, with declivity at 60 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices nonacuminate, conjointly slightly emarginate; with humeri well-developed, obliquely angulate, somewhat produced; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals more convex and elevated, broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae inconspicuous, subrecumbent, curled, coarse, pale, each surrounded by scales of same color as other scales; even numbered intervals flattened, interval 2 not impressed; disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedecrivital swelling of 3rd interval weakly-developed, but evident; declivital callus of 5th interval well-developed, subquadrate, calli of intervals 3 and 5 unequal in size; confluence of intervals 3 and 9 swollen; striae grooves distinct, moderately deep, narrow, with punctures small, round, narrow, deep, not wider than striae grooves; scales granulate, contiguous, finely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, black, brown, and white; maculate; humeri with white macula; antedecrivital callus or area of interval 3 with white macula; declivital callus or area of interval 5 white; otherwise with numerous pale brown subfasciate maculae, and few small white maculae on black base color; cuticle black. **Abdominal sterna** with punctures small. Sternum 1 with median impression continuous for entire length, deep, broad, slightly narrowed apically, not deeper apically, continued shallowly on sternum 2; apical margin not declivous; 1.20 as long as 2; suture between 1 & 2 bisinuate, broadly finely incised medially, deep laterally. Sternum 2 medially impressed, with impression narrow, moderately deep, with transverse row of evident subrecumbent to suberect coarse setae, apical margin moderately declivous, not impressed on declivity, 1.67 as long as 3 & 4 together. Sternum 5 with median subapical and pair of subbasal lateral impressions; basally flat; with median impression very shallow, broad, subtriangular, without **carinate** margins; with lateral impressions shallow, small, slightly deeper than median impression; with two pairs of apicolateral setae, with setae suberect, coarse, 1.42 as long as 3 & 4 together, 0.85 as long as 2, 0.71 as long as 1. **Legs** moderately short; femora clavate, black, with basal half reddish brown. Tibiae moderately slender, reddish brown, with inner margin weakly bisinuate, with outer margin moderately arcuate toward apex (in lateral view); with apices not narrowed; with inner surface with denticles few, distinct, small, with few inconspicuous bristles on inner surface, with short, inconspicuous bristles on outer surface; with uncus long, moderately slender, subequal to width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with 1 very small denticle, with 1 or 2 short setae on inner surface. Tarsi moderately short, sublinear, reddish brown, tarsomeres 1-3 broadened toward apex; tarsomere 3 distinctly wider at apex than 2, subcordate, subemarginate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally finely pubescent; claws reddish brown. **Length**, pronotum and elytron: 2.40 mm.

**Female.** Same as male except: **Rostrum** not evidently subquadrately expanded apically.

Frons very broad, 0.71 as wide as head across eyes. Sternum 1 with median impression in basal 1/4 only, shallow, broad, narrowed apically, not continued on sternum 2; flattened in apical 3/4. Sternum 2 flattened, Sternum 5 with pair of subbasal lateral impressions only, with apicomedian area flat; with basal area flat; with lateral impression very shallow, small. **Length**, pronotum and elytra: 2.95 mm.

**Genitalia and associated structures.** -- **Male. Median lobe** with dorsal surface excluding orificial area, fully sclerotized; with ventral surface membranous; markedly broadest basally and constricted at extreme base, tapering toward apex; somewhat elongate, with extreme apex subacute, narrowly rounded, slightly subapically constricted, slender in lateral view, tapering and narrowly rounded; with dorsobasal margin distinct, slightly to deeply emarginate; with ventrobasal margin not distinguishable; with dorsal surface behind orifice poorly sclerotized, orifice apparently elongate-oval (i.e., pseudo-orifice produced), with proximal margin of pseudo-orifice distinct, deeply concave, with pseudo-orifice short, slightly enlarging apparent orifice. Orifice triangular; with proximal margin indistinct, not sclerotized. **Apodemes** long, 1.15 as long as median lobe. **Internal sac.** Orificial sclerites lacking; internal sac with numerous fine spicules and with two pairs of dense suborificial fields of spicules. **Female. Sternum VIII** with apical setae several, short, robust, with few very short conical sensilla; arms broad, parallel, with inner margins more or less straight, with outer margins broadly, deeply emarginate; fenestral area open, elongate-narrow. **Apodemes** moderately divergent near apex only, narrowly separated to base. **Spermatheca.** Ramus distinct, not extending past insertion of spermathecal duct, set off from body by shallow emargination; spermathecal gland arising at apex of ramus. Nodulus slightly concave and irregularly wrinkled. **Gonocoxae** short, robust, with apex rounded, glabrous apically (or setae not distinguishable); with styli distinct, apicolaterally inserted. **Bursa copulatrix** simple, without sclerites. **Tergum VIII** rounded, almost hemispherical; with apical margin medially slightly truncate, very slightly reflexed but not forming distinct lip; apicolaterally not at all swollen, with lateral margins not at all inflexed ventrolaterally. **Pygidium** with apex truncate.

**Intraspecific Variation.** -- The white antedeclivital macula is often restricted to the antedeclivital swelling of the 3rd elytral interval, but may extend onto the 2nd interval, and rarely may be scarcely visible. The declivital callous of the 5th elytral interval is usually well-developed, and subquadrate to subacute; and rarely is weakly developed, and subquadrate to rounded. Size range 2.35 - 3.10 mm.

**Remarks and Comparative Notes.** -- This common species could be confused with several others. *B. occultus* is the only species with an apical median carina on the rostrum, and it possesses long tarsi, with tarsomere 3 not wider than 2. *B. spiculatus* has a foveate frons, lacks an antedeclivital swelling on the 3rd elytral interval, and has an angulate and carinate ventral margin on the rostrum. *B. subcordatus* has an angulate ventral margin of the rostrum, and short tarsi with tarsomere 3 much broader than 2 and subcordate. *B. lewisi* has a foveate frons, the ventral margin of the rostrum subangulate, and has a weakly developed antedeclivital swelling on elytral interval 3.

**Notes on Type Specimen.** -- Holotype (by designation) male (not dissected), with the following labels: 1) [rectangular; whitish; printed in black ink] [Amami - Ohshima] Akagina 17.vii.1954 S.Miyamoto & Y.Hirashima 2) [rectangular; peach-colored; handprinted in black ink] Holotype ♂ *Bagous kagiashi* Chûjo [sic] et Morimoto 1959. Point mounted. Apical three fifths of tibia and tarsi missing from right front leg. Apex of tibia, uncus and tarsi missing from left hind leg. Deposited in Kyushu University, Fukuoka, Japan.

**Biological Note.** -- **No** data are available.

**Type Locality.** -- Japan, Ryukyu Islands, Amami-Ōshima, Akagina.

**Range.** -- Honshū, Shikoku, Ryukyu Islands, Japan; Korea (according to published records).

**Material Examined.** -- Holotype (see above), allotype, 2 paratypes and 13 non-paratypes. [JAPAN: **Honshū:**] Mt. Takago Chiba pref. 18-VII-1964, H. Yamazaki (2, KU); Nigachi Miyagi-cho Miyagi Pref. 2.viii.1979 T. Watanabe (1, KU); Tokoname Aichi Pref. 3.viii.1976 M. Tsuzuki / [Japanese characters] (2, CWOB; 2, KU); [Ryukyu Islands:] Amami-Ōshima [sic] Shinmura 19 VII 1954 S. Hisamatsu (1, KU); [Amami-Oshima] Yuwan-Shinmura 22.vii.1954 S. Miyamoto & Y. Hirashima / Paratype ♀ *Bagous kagiashi* Chujo et Morimoto 1959 [blue handwritten] (1, KU); same data / Allotype ♀ *Bagous kagiashi* Chujo [sic] et Morimoto 1959 (1, KU); Chizuka Okinawa I Jul;-Sept / GE Bohart CL Harnage (2, USNM); HEGINA Ishigaki Is. 11 IV 1975 T. Takahashi (1, KU); Ryukyu, Nishinakama Amami, 1-7.VI.1970 H. Makihara leg. (1, KU); (Ryukyus) Sonai Iriomote I. 27.V.1977 J. Okuma (1, KU); [Shikoku:] Paratype [yellow-trimmed disc] / (Shikoku) Jinzenji Kochi City 6.VII.1954 K. Morimoto / Brit. Mus. 1968 735 / Paratype ♂ *Bagous kagiashi* Chūjo et Morimoto 1959 [blue handwritten] (1, BMNH).

***Bagous spiculatus* O'Brien & Morimoto, new species.**

Figures 9-10, 44, 59.

**DESCRIPTION -- Holotype male.** -- Body medium sized, elongate-oval, moderately robust. Rostrum long, 1.07 as long as prothorax; black, with apex reddish brown; subcylindrical; with dorsal curvature moderate and uneven; with ventral curvature weak and even; moderately depressed in apical 1/3; with median basal carina lacking; with apical median carina lacking; with basolateral sulcus moderately developed, narrow, long, coarsely punctate; with ventral margin angulate, distinctly carinate; with sides unevenly subparallel, evenly, not quadrately expanding from just behind antennal insertion to apex; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales dense in basal 1/2, subgranulate, subcontiguous, finely pitted, oval, greyish brown, more coarsely subgranulate and pitted basally, subglabrous apically, nongranulate, not contiguous, finely pitted, round, metallic; without numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; with dense coarse rugose elongate punctures, with punctures becoming sparser and finer apically. Head moderately convex; with swelling beside eye lacking; with eyes moderately convex; with scales granulate, contiguous, pitted, round, black and greyish white; with plumose scales whitish, on articulating area. Supraocular setae few, short, indistinct, suberect, curved, coarse, seta like, linearly arranged. Frons without submedian setae; broad, 0.57 as wide as head across eyes, somewhat flattened, indefinitely shallowly impressed, indistinctly set off from rostrum by shallow impression; with median fovea, fovea shallow. Antennae inserted just behind apical 1/3, inserted laterally; scape long, moderately slender, subclavate; scape and funicle reddish brown; funicle moderately short, 0.63 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club long, broad-oval, 0.79 as long as funicle, reddish brown. Pronotum transverse, 0.88 as long as broad; with sides unevenly subparallel, not expanding from base; with apical constriction moderate, in apical 1/4, dorsally distinct and uniform, weakly rounded behind constriction, with

sides not impressed somewhat behind constriction; with median sulcus indistinct, narrow, incomplete, forming subbasal impression, with subbasal impression small, weak, shallow; with disc transversely flattened, not undulate, rugulose; with apical and marginal setae moderate in number, scarcely evident, short, suberect, curved, coarse; with carina of basal margin lacking; with scales coarsely granulate, pitted, subcontiguous, round, blackish brown; with 3 vittae, with median vitta narrow, interrupted, distinct, uneven, whitish; with lateral vitta broad, uneven, whitish; not maculate on disc; with sides greyish white, with indefinite blackish brown maculae; with ocular lobes strongly developed, reddish brown. **Prosternal sulcus** deep, broad, weakly narrowed at apical constriction, biangulate; with side margins moderately sharply raised, with lateral margin just in front of coxae (lateral view) subacute. **Elytra** subparallel behind humeri to declivity, with declivity at 60 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices nonacuminate, conjointly rounded; with humeri well-developed, obliquely angulate, not at all projecting; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals more convex and elevated, broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae inconspicuous, subrecumbent, curled, coarse, pale whitish, each surrounded by scales of same color as other scales; even numbered intervals unevenly flattened, interval 2 not impressed; disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedeclivital swelling of 3rd interval lacking (though white maculae often appear raised); declivital callus of 5th interval weakly developed, subangulate; confluence of intervals 3 and 9 slightly swollen; striae grooves indistinct, uneven, narrow, with punctures minute, scarcely evident, round, narrow, deep, not wider than striae grooves; scales subgranulate, imbricate, finely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, black, brown, and white; fasciate; humeri with white macula; antedeclivital callus or area of interval 3 with white macula; declivital callus or area of interval 5 white; otherwise with moderately narrow oblique interrupted posthumeral greyish white fascia meeting antedeclivital white macula on 3rd interval and with scattered greyish white maculae on black and brown base color; cuticle black. **Abdominal sterna** with punctures small. Sternum 1 with median impression continuous for entire length, moderately deep, broad, slightly narrowed apically, not deeper apically, not continued on sternum 2; apical margin not declivous; 1.64 as long as 2; suture between 1 & 2 bisinuate, broadly finely incised medially, deep laterally. Sternum 2 flattened, with transverse row of scarcely evident (often denuded) subrecumbent coarse setae, apical margin moderately declivous, not impressed on declivity, 1.22 as long as 3 & 4 together. Sternum 5 with pair of subbasal lateral impressions; with apicomedian area flat; basally transversely subcostate; with lateral impressions very shallow, small; with one pair of apicolateral setae, with setae suberect, coarse, 1.22 as long as 3 & 4 together, 1.00 as long as 2, 0.61 as long as 1. **Legs** moderately long; femora clavate, black, with basal half reddish brown. Tibiae moderately slender, reddish brown, with inner margin weakly bisinuate, with outer margin moderately arcuate toward apex (in lateral view); with apices slightly narrowed; with inner surface with denticles several, distinct, small, with several moderately short bristles on inner surface, with short, inconspicuous bristles on outer surface; with uncus long, moderately stout, longer than width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with 2 small denticles, with 1 or 2 short setae on inner surface. Tarsi moderately short, broad, reddish brown, tarsomeres 1-3 broadened toward apex; tarsomere 3 distinctly wider at apex than 2, subcordate, subemarginate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally with coarse scalelike long setae; claws reddish brown. **Length**,

pronotum and elytron: 2.90 mm.

*Allotype female.* Same as male except: Sternum 1 with median impression in basal 1/2 only, moderately shallow, broad; flattened in apical 1/2; 1.15 as long as 2. Sternum 5 with median subapical and pair of subbasal lateral impressions, with apicomedian area transversely concave; with basal area flat; with median impression shallow, narrow, transverse; without carinate margins; with lateral impression lacking. **Length**, pronotum and elytra: 2.65 mm.

*Genitalia and associated structures.* -- **Male. Median lobe** with dorsal surface excluding orificial area, fully sclerotized; with ventral surface fully sclerotized; very slightly broader basally and constricted at extreme base, tapering toward apex; somewhat elongate, with extreme apex subacute, narrowly rounded, slightly subapically constricted, slender in lateral view, tapering and narrowly rounded, with dorsobasal margin distinct, deeply emarginate; with ventrobasal margin distinct, with short basal plate extending between apodemes, visible from above; with dorsal surface behind orifice poorly sclerotized, orifice apparently elongate-oval (i.e., pseudo-orifice produced), with proximal margin of pseudo-orifice distinct, arcuate, with pseudo-orifice short, slightly enlarging apparent orifice. Orifice more or less oval; with proximal margin indistinct, not sclerotized. **Apodemes** long, 1.24 as long as median lobe. **Internal sac.** Orificial sclerites lacking; internal sac with numerous fine spicules and with pair of dense suborificial fields of spicules. **Female. Sternum VIII** with apical setae numerous, long, slender; arms broad, divergent, slightly basally fused, with inner margins more or less straight, with outer margins broadly, deeply emarginate; fenestral area open, triangular. **Apodemes** markedly divergent near apex only, narrowly separated to base. **Spermatheca.** Ramus indistinct, not extending past insertion of spermathecal duct, set off from body by shallow emargination. Nodulus produced, sinuate. **Gonocoxae** short, robust, constricted subapically, with apex oblique, glabrous apically (or setae not distinguishable); with styli distinct, apicolaterally inserted. **Bursa copulatrix** simple, without sclerites. Tergum VIII rounded, almost hemispherical; with apical margin medially slightly truncate, very slightly reflexed but not forming distinct lip; apicolaterally not at all swollen, with lateral margins slightly inflexed ventrolaterally. Pygidium with apex truncate.

*Intraspecific Variation.* -- The sides of the prothorax vary from unevenly subparallel and not expanded from the base, to rather strongly expanding from the base, and rarely even rather broadly rounded. The narrow median pronotal sulcus often is complete and evident, and rarely is completely concealed by a dense earthen coating. Size range 2.65 -3.15 mm.

*Etymological Note.* -- This epithet is based on the Latin adjective *spiculatus* (= covered with fine points) and refers to the distinctive large masses of spicules on the endophallus of the male median lobe.

*Remarks and Comparative Notes.* -- This species could be confused with *B. kagiashi* but it lacks a strongly carinate basal margin of the pronotum, and the latter has a foveate frons. *B. subcordatus* lacks the carinate ventral margin of the rostrum, and has the antennae inserted just behind the apical 1/3 of the rostrum. *B. occulatus* has long tarsi, with tarsomere 3 only slightly wider than 2, and possesses a suddenly and strongly clavate antennal scape. *B. lewisi* has the ventral margin of the rostrum subangulate only, not carinate and has a weakly developed antedeclytival swelling on elytral interval 3.

*Biological Note.* -- No data are available.

*Type Locality.* -- Japan, Honshu, Shimane Prefecture, Yamakata Kitsuki-cho.

*Notes on Type Specimen(s).* -- Holotype (by designation) male (dissected), with the following labels: **1**) [rectangular; white; handprinted in black ink] Yamakata Kitsuki-cho

Shimane Pref. 20-VII-1978 S. Tanaka 2) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1991 3) [rectangular; red; printed in black ink] HOLOTYPE *Bagous spiculatus* O'Brien & Morimoto 1994. Point mounted. Right front leg missing tarsus and half of tibia. Left antenna missing club and funicle. Type deposited in Kyushu University, Fukuoka, Japan. Type number 2910.

**Range.** -- Honshū, Shikoku, Japan.

**Material Examined.** -- Holotype, allotype and 10 paratypes. [JAPAN: Honshū:] Japore Center (Kioto!) / 84 (1, MNHN); Japan G. Lewis 1910-320. / Miyanoshita (1, BMNH); Japan G. Lewis 1910-320 / Miyanoshita / Miya 5/81. (1, BMNH); (Honshti) Nigachi Miyagi-cho Miyagi Pref. 2.viii. 1979 T. Watanabe (1, KU); (Honshu) Okura Miyagi-cho 8.vii. 1978 T. Watanabe (1, KU); (Honshti) Sasaguchi-hama, Echigo 30.VIII. 1957 K. Baba (1, KU); Tokoname Aichi Pref. 3.viii. 1976 M. Tsuzuki / [Japanese characters] (1, CWOB; 1 KU); Yamakata Kitsuki-cho Shimane Pref. 20.VII. 1978 S. Tanaka (1, CWOB; **holotype**, KU; 1, USNM); [Shikoku:] (Shikoku) Jinzenji Kochi City 2.VIII. 1954 K. Morimoto (**allotype**, KU).

*Bagous occultus* O'Brien & Morimoto, new species.

Figures 11-12, 35, 42.

*Bagous kagiashi* Chûjô & Morimoto (1959: 150), ex **parte**.

DESCRIPTION -- *Holotype male*. -- Body medium sized, elongate-oval, moderately robust. **Rostrum** moderately long, 0.90 as long as prothorax; black, with apex reddish brown; subcylindrical; with dorsal curvature weak and uneven; with ventral curvature nearly straight; weakly depressed in apical 1/3; with median basal carina lacking; with apical median carina well developed; with basolateral sulcus deep, narrow, long, coarsely punctate; with ventral margin subangulate, not carinate; with sides unevenly subparallel, evenly, not quadrately expanding from just behind antennal insertion to apex; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales dense in basal 2/3, subgranulate, contiguous, finely pitted, oval, metallic, more coarsely subgranulate and pitted basally, sparser in apical 1/3 and denuded, at least in part, denuded, not contiguous, or not applicable, denuded, oval, or not applicable, denuded; without numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; coarsely densely punctate, with punctures becoming sparser and finer apically. Head weakly convex; with swelling beside eye lacking; with eyes moderately convex; with scales subgranulate, contiguous, pitted, round, grey-brown and white; with plumose scales whitish, on articulating area. Supraocular setae few, not visible, not visible, not visible, not visible, not visible. Frons without submedian setae; broad, 0.62 as wide as head across eyes, weakly convex, not impressed, indistinctly set off from rostrum by shallow impression; not sulcate nor foveate medially. **Antennae** inserted at apical 1/3, inserted laterally; scape long, moderately stout, clavate; scape and funicle reddish black; funicle moderately long, 0.73 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club long, broad-oval, 0.63 as long as funicle, reddish black. **Pronotum** transverse, 0.86 as long as broad; with sides unevenly, weakly rounded, moderately expanding from base;

with apical constriction weak, in apical 1/8, dorsally shallower medially, weakly rounded behind constriction, with sides not impressed somewhat behind constriction; with median sulcus distinct, narrow, incomplete, of uniform depth and width or almost so; with disc transversely weakly convex, not undulate, rugulose; with apical and marginal setae moderate in number, moderately distinct, short, suberect, curved, coarse; with **carina** of basal margin lacking; with scales coarsely granulate and rugulose, pitted, subcontiguous, round, blackish brown; with 3 vittae, with median vitta narrow, complete, distinct, straight, whitish; with lateral vitta broad, uneven, whitish; not maculate on disc; with sides brown, with indefinite blackish brown maculae; with ocular lobes strongly developed, reddish black. **Prosternal sulcus** moderately deep, broad, strongly narrowed at apical constriction, biangulate; with side margins moderately raised, with lateral margin just in front of **coxae** (lateral view) subacute. **Elytra** subparallel, sinuate behind humeri to declivity, with declivity at 45 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices subacuminate, conjointly slightly emarginate; with humeri well-developed, obliquely angulate, not at all projecting; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals more convex and elevated, broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae inconspicuous, subrecumbent, curled, coarse, pale whitish, each surrounded by scales of same color as other scales; even numbered intervals flattened, interval 2 not impressed; disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedecrivital swelling of 3rd interval lacking (though white maculae often appear raised); declivital callus of 5th interval well-developed, subquadrate; confluence of intervals 3 and 9 slightly swollen; striae grooves indistinct, uneven, narrow, with punctures small, round, narrow, deep, not wider than striae grooves; scales subgranulate, contiguous, finely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, black, brown, and white; maculate; humeri with white macula; antedecrivital callus or area of interval 3 with white macula; declivital callus or area of interval 5 with small white macula; otherwise color in large part concealed by dense dirty waterproof coating, base color brown, with dark brown and whitish maculae; cuticle black. **Abdominal sterna** with punctures moderate in size. Sternum 1 with median impression continuous for entire length, deep, broad, deeper apically, continued shallowly on sternum 2; apical margin not declivous, 1.14 as long as 2; suture between 1 & 2 bisinuate, broadly finely incised medially, deep laterally. Sternum 2 medially impressed, with impression narrow, shallow, not apically declivous, 1.56 as long as 3 & 4 together. Sternum 5 with pair of subbasal lateral impressions; with apicomedian area flat; basally transversely convex; with lateral impressions very shallow, small; with one pair of apicolateral setae, with setae suberect, coarse, 1.22 as long as 3 & 4 together, 0.79 as long as 2, 0.69 as long as 1. **Legs** moderately long; femora clavate, black. Tibiae moderately slender, reddish black, with inner margin weakly bisinuate, with outer margin moderately arcuate toward apex (in lateral view); with apices not narrowed; with inner surface with denticles few, distinct, tibiae small, with few inconspicuous bristles on inner surface, with short, moderately distinct bristles on outer surface; with uncus long, moderately stout, longer than width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with 1 very small denticle, with 1 or 2 short setae on inner surface. Tarsi long, sublinear, reddish black, tarsomeres 1-3 slightly widened toward apex; tarsomere 3 slightly wider at apex than 2, sublinear, truncate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally finely pubescent; claws reddish brown. **Length**, pronotum and elytron: 2.80 mm.

*Female not known.*

**Genitalia and associated structures.** -- Male. **Median lobe** markedly compressed, dorsoventrally flattened; with dorsal surface excluding orificial area, fully sclerotized; with ventral surface fully sclerotized; very slightly broader basally and constricted at extreme base; rather elongate, with extreme apex subacute, narrowly rounded, very slightly subapically constricted, very slender in lateral view, declivous, tapering and narrowly rounded, with ventroapical tubercle; with dorsobasal margin distinct, deeply emarginate; with ventrobasal margin distinct, with short basal plate extending between apodemes, visible from above. Orifice more or less oval, very short; with proximal margin distinct, markedly sclerotized. **Apodemes short, 0.65** as long as median lobe. **Internal sac.** Orificial sclerites lacking; internal sac with numerous fine spicules and with about 6 lateral, large acute teeth on each side about midlength.

**Intraspecific Variation.** -- Known from the holotype only.

**Etymological Note.** -- This epithet is based on the Latin participle *occultus* (= hidden) and refers to our finding this species “hidden” among the paratypes of *B. kagiashi* Chûjô and Morimoto.

**Remarks and Comparative Notes.** -- This is the only currently known species with an apical median carina on the rostrum. This could easily be concealed by a waterproof and/or earthen coating. *B. kagiashi* resembles this species but has moderately short tarsi, with tarsomere 3 distinctly wider than 2, and has a distinct antedeclevital swelling on elytral interval 3. *B. spiculatus* also possesses tarsi similar to *B. kagiashi*, and has an antennal scape which is moderately stout and evenly clavate.

**Biological Note.** -- No data area available.

**Type Locality.** -- Japan, Shikoku, Jinzenji, Kochi City.

**Notes on Type Specimen(s).** -- Holotype (by designation) male (dissected), with the following labels: 1) [rectangular; tan-whitish; printed in black ink] [Shikoku] [Japanese calligraphy] Jinzenji [Japanese calligraphy] (c.Kochi) 25-VIII. 1953 K. Morimoto 2) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1991 3) [rectangular; blue; handprinted in black ink] Paratype ♂ *Bagous kagiashi* Chujo et Morimoto 1959 4) [rectangular; yellow; printed in black ink] Property of Entomol. Lab., Kyushu Univ. 5) [rectangular; red; printed in black ink] HOLOTYPE *Bagous occultus* O'Brien & Morimoto 1994. Point mounted. Tarsi missing from left front leg, and right front and right middle legs. Deposited in Kyushu University, Fukuoka, Japan. Type number 2911.

**Range.** -- Shikoku, Japan.

**Material Examined.** -- Holotype. [JAPAN: Shikoku:] Shikoku Jhizenji [sic] (c.Kochi) 28.VIII.1953 K. Morimoto / Paratype ♂ *Bagous kagiashi* Chujo et Morimoto 1959 [blue handwritten] (holotype., KU).

***Bagous subcordatus*** O'Brien & Morimoto, new species.

Figures 13-14, 36, 63.

**DESCRIPTION -- *Holotype female.*** -- Body medium sized, moderately broadly elongate-oval, moderately robust. Rostrum long, 1.17 as long as prothorax; black, with apex reddish brown; subcylindrical; with dorsal curvature moderate and even; with ventral curvature moderate and even; not more distinctly depressed toward apex; with median basal carina lacking; with apical median carina lacking; with basolateral sulcus deep, narrow, short, coarsely punctate; with ventral margin angulate, not carinate; with sides unevenly subparallel, evenly, not quadrately expanding from just behind antennal insertion to apex; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales denuded basally, at least in part, subgranulate, subcontiguous, finely pitted, oval, metallic, denuded, denuded, at least in part; without numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; with small dense elongate punctures, with punctures becoming sparser and finer apically. Head moderately convex; with swelling beside eye lacking; with eyes weakly convex; with scales granulate, contiguous, coarsely pitted, round, brown and white; with plumose scales whitish, on articulating area. Supraocular setae few, short, distinct, suberect, curved, coarse, scale like, linearly arranged. Frons without submedian setae; broad, 0.64 as wide as head across eyes, somewhat flattened, shallowly impressed, not set off from rostrum by impression; with median sulcus, sulcus deep, narrow, short. Antennae inserted just behind apical 1/3, inserted laterally; scape long, slender, subclavate; scape and funicle reddish brown; funicle moderately long, 0.67 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club broad-oval, 0.67 as long as funicle, reddish black. Pronotum transverse, 0.91 as long as broad; with sides subparallel, moderately expanding from base; with apical constriction moderate, in apical 1/5, dorsally shallower medially, moderately rounded behind constriction, with sides not impressed somewhat behind constriction to slightly impressed behind round area; with median sulcus indistinct, narrow, complete, of uniform depth and width or almost so; with disc transversely weakly convex, not undulate, rugulose; with apical and marginal setae moderate in number, scarcely evident, short, suberect, curved, fine; with carina of basal margin indistinct, in median 1/3; with scales coarsely granulate, coarsely pitted, subcontiguous, round, dark brownish black; with 3 vittae, with median vitta narrow, complete, distinct, uneven, pale greyish; with lateral vitta narrow, obliquely angled, pale greyish; not maculate on disc; with sides brown, with indefinite whitish maculae and vittae; with ocular lobes moderately developed, reddish brown. Prosternal sulcus moderately deep, moderately broad, strongly narrowed at apical constriction, biangulate; with side margins moderately sharply raised, with lateral margin just in front of coxae (lateral view) subacute. Elytra subparallel behind humeri to declivity, with declivity at 60 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices subacuminate, conjointly slightly emarginate; with humeri well-developed, obliquely angulate, somewhat produced; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals more convex and elevated, broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae inconspicuous, subrecumbent, curled, coarse, pale whitish, each surrounded by scales of same color as other scales; even numbered intervals weakly convex to flat, interval 2 not impressed; disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedeclevital swelling of 3rd interval

lacking (though white maculae often appear raised); declivital callus of 5th interval well-developed, subangulate; confluence of intervals 3 and 9 slightly swollen; striae grooves distinct, moderately deep, narrow, with punctures small, round, narrow, deep, not wider than striae grooves; scales subgranulate, contiguous to imbricate, finely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, brown, whitish and black; fasciate-maculate; humeri with white macula; antedecrivital callus or area of interval 3 with small white macula; declivital callus or area of interval 5 white; otherwise with indefinite oblique humeral, posthumeral and declivital greyish white fasciae, and scattered brown, black, greyish white and white maculae; cuticle reddish black. **Abdominal sterna** with punctures small. Sternum 1 with median impression interrupted (basal and apical), flattened in middle 1/2; impression in apical 1/4; impression in basal 1/4, moderately deep, broad, not deeper apically, not continued on sternum 2; apical margin not declivous; 1.21 as long as 2; suture between 1 & 2 bisinuate, broadly finely incised medially, deep laterally. Sternum 2 flattened, with multiple transverse rows of evident (often denuded) subrecumbent coarse setae, apical margin moderately declivous, not impressed on declivity, 2.00 as long as 3 & 4 together. Sternum 5 with median subapical and pair of subbasal lateral impressions; basally transversely subcostate; with median impression very shallow, broad, transverse; with lateral impressions very shallow, small, subequal to median impression in depth; with one pair of apicolateral setae, with setae suberect, coarse, 1.7 1 as long as 3 & 4 together, 0.86 as long as 2, 0.71 as long as 1. Legs moderately short; femora clavate, black, with basal half reddish brown. Tibiae moderately slender, reddish brown, with inner margin weakly bisinuate, with outer margin slightly arcuate toward apex (in lateral view); with apices not narrowed; with inner surface with denticles numerous, distinct, both stout and minute, with numerous conspicuous short bristles on inner surface, with short, moderately distinct bristles on outer surface; with uncus moderately long, moderately stout, subequal to width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with minute denticles, with 1 or 2 short setae on inner surface. Tarsi short, broad, reddish black, tarsomeres 1-3 broadened toward apex; tarsomere 3 distinctly wider at apex than 2, subcordate, subemarginate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally finely pubescent; claws reddish brown. **Length**, pronotum and elytron: 2.90 mm.

*Male not known.*

**Genitalia and associated structures.** -- **Male** not known. **Female.** **Sternum VIII** with apical setae few, long, robust; arms broad, parallel, with inner margins broadly, shallowly arcuate, with outer margins broadly, deeply emarginate; fenestral area open, elongate-narrow. **Apodemes** broadly divergent from apical 1/3, narrowly separated to base. **Spermatheca.** Ramus indistinct, not extending past insertion of spermathecal duct, with outline almost uniformly continuous with body. Nodus produced, sinuate. **Gonocoxae** short, robust, with apex oblique, glabrous apically (or setae not distinguishable); with styli distinct, apically inserted. **Bursa copulatrix** simple, without sclerites. **Tergum VIII** rounded, almost hemispherical; with apical margin medially slightly truncate, not raised to form narrow marginal carina; apicolaterally not at all swollen, with lateral margins not at all inflexed ventrolaterally. **Pygidium** with apex truncate.

**Intraspecific Variation.** -- Varies from moderately robust to robust, with the declivital callus of the 5th elytral interval weakly developed to well-developed and weakly rounded to subquadrate. Size range 2.90 - 3.20 mm.

**Etymological Note.** -- This epithet is based on the Latin prefix *sub-* (= somewhat, less than) and the Latin adjective *cordatus* (= cordate with two equal rounded lobes at apex), which refer

to the strongly subcordate third tarsomere of this species.

**Remarks and Comparative Notes.** -- This species can be confused easily with *B. kagiashi* but the latter does not have the ventral margin of the rostrum angulate, and has a distinct antedeclevital swelling of elytral interval **3**. *B. oculatus* is similar as well, but has long tarsi with tarsomere 3 only slightly wider than 2, and has the scape suddenly strongly clavate. *B. spiculatus* has the frons foveate and the ventral margin of the rostrum is both carinate and angulate.

**Biological Note.** -- No data are available.

**Type Locality.** -- Japan, Hokkaido, Engaru Monbetsu gun.

**Notes on Type Specimen(s).** -- Holotype (by designation) female (dissected), with the following labels: 1) [rectangular; whitish; printed in black ink] (Honshu) Takefu Fukui Pref. 25.viii.1952 Y. Murakami 2) [rectangular; yellow; printed in black ink] Property of Entomol. Lab., Kyushu Univ. 3) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1991 4) [rectangular; red; printed in black ink] HOLOTYPE Bagous subcordatus O'Brien & Morimoto 1994. Point mounted. Tarsi missing from the right, middle and hind legs. Deposited in Kyushu University, Fukuoka, Japan. Type number 2912.

**Range.** -- Hokkaido, Honshū, Japan.

**Material Examined.** -- Holotype and 1 paratype. [JAPAN: Hokkaido:] (Hokkaido) Engaru Monbetsu gun 7-viii-1955 K. Morimoto (holotype, KU); [**Honshū**:] (Honshu) Takefu Fukui Pref. 25.viii.1952 Y. Murakami (1, CWOB).

Bagous bipunctatus (Kôno)

Figures 15-16, 45, 58.

*Himeniphades bipunctatus* Kôno(1934:246).

*Bagous bipunctatus* (Kôno), Chûjô and Morimoto (1959: 150).

**REDESCRIPTION** -- **Male.** -- Body medium sized, elongate broad-oval, robust. Rostrum long, 1.15 as long as prothorax; black, with apex reddish brown; subcylindrical; with dorsal curvature strong and uneven; with ventral curvature weak and even; moderately depressed in apical 1/3; with median basal carina lacking; with apical median carina lacking; with basolateral sulcus moderately developed, narrow, long, coarsely punctate; with ventral margin subangulate, subcarinate; with sides unevenly subparallel, evenly, not quadrately expanding from just behind antennal insertion to apex; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales dense in basal 2/3, subgranulate, subcontiguous, pitted, oval, metallic, more coarsely subgranulate and pitted basally, sparser in apical 1/3, subgranulate, not contiguous, finely pitted, oval, metallic; without numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; with few coarse punctures, with punctures becoming sparser and finer apically. Head moderately convex; with swelling beside eye lacking; with eyes weakly convex; with scales subgranulate, contiguous, pitted, round, grey-brown and white; with plumose scales whitish, on articulating area. Supraocular setae few, long, distinct, suberect, curved, slender, seta like, linearly arranged. Frons without submedian setae; broad, 0.68 as wide as head across eyes, somewhat

flattened, indefinitely shallowly impressed, not set off from rostrum by impression; with median fovea, fovea deep, small. **Antennae** inserted just in front of apical 1/3, inserted laterally; scape long, moderately slender, subclavate; scape and funicle reddish; funicle moderately short, 0.64 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club short, broad-oval, 0.50 as long as funicle, reddish black. **Pronotum** transverse, 0.85 as long as broad; with sides unevenly subparallel, very weakly expanding from base; with apical constriction strong, in apical 1/6, dorsally distinct and uniform, weakly rounded behind constriction, with sides slightly impressed behind round area; with median sulcus distinct, very narrow, complete, forming subapical and subbasal impressions, with subbasal impression small, strong, shallow; with apical impression small, weak, shallow; with disc transversely weakly convex, not undulate, rugulose; with apical and marginal setae moderate in number, moderately distinct, short, subrecumbent, curved, coarse; with carina of basal margin lacking; with scales coarsely granulate and rugulose, coarsely pitted, subcontiguous, round, dark brownish black; with 3 vittae, with median vitta narrow, complete, distinct, straight, whitish; with lateral vitta broad, strongly curved, whitish; not maculate on disc; with sides whitish brown, with indefinite blackish brown maculae; with ocular lobes moderately developed, reddish brown. **Prosternal sulcus** deep, moderately broad, strongly narrowed at apical constriction, biangulate; with side margins moderately sharply raised, with lateral margin just in front of coxae (lateral view) rounded. **Elytra** subparallel, sinuate behind humeri to declivity, with declivity at 60 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices nonacuminate, conjointly slightly emarginate; with humeri well-developed, obliquely angulate, somewhat produced; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals more convex and elevated, not broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae inconspicuous, subrecumbent, curled, coarse, pale, each surrounded by scales of same color as other scales; even numbered intervals weakly convex to flat, interval 2 not impressed; disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedeclytival swelling of 3rd interval lacking (though white maculae often appear raised); declivital callus of 5th interval weakly developed, subangulate; confluence of intervals 3 and 9 swollen; striae grooves distinct, deep, narrow, with punctures minute, scarcely evident, round, narrow, deep, not wider than striae grooves; scales subgranulate, contiguous, coarsely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, black, brown, and white; fasciate-maculate; humeri with moderately large white macula; antedeclytival callus or area of interval 3 with white macula; declivital callus or area of interval 5 with small white macula; otherwise with broad white antedeclytival fascia narrowly interrupted on suture, narrow white oblique fascia behind humerus and indefinite brown and black maculae (occasionally coalescing to form indefinite fasciae); cuticle black. **Abdominal sterna** with punctures moderate in size. Sternum 1 with median impression continuous for entire length, deep, broad, not deeper apically, continued shallowly on sternum 2; apical margin not declivous; 1.57 as long as 2; suture between 1 & 2 bisinuate, uniformly deep. Sternum 2 medially impressed, with impression narrow, shallow, with multiple transverse rows of evident (often denuded) subrecumbent coarse setae, apical margin moderately declivous, not impressed on declivity, 1.67 as long as 3 & 4 together. Sternum 5 with pair of subbasal lateral impressions; with apicomedian area flat; basally transversely convex; with lateral impressions moderately deep, small; with one pair of apicolateral setae, with setae suberect, coarse, 1.44 as long as 3 & 4 together, 0.87 as long as 2, 0.72 as long as 1. **Legs** moderately

short; femora strongly clavate, reddish brown. Tibiae moderately slender, reddish brown, with inner margin weakly bisinuate, with outer margin moderately arcuate toward apex (in lateral view); with apices **not** narrowed; with inner surface with denticles several, distinct, stout, with few inconspicuous bristles on inner surface, with short, inconspicuous bristles on outer surface; with **uncus** moderately long, moderately stout, **subequal** to width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with denticles like fore- and midtibiae, with similar number of setae as fore- and mid-tibiae. **Tarsi** moderately short, broad, reddish black, tarsomeres 1-3 broadened toward apex; tarsomere 3 distinctly wider at apex than 2, broadly **cordate**, rather deeply emarginate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally finely pubescent; claws reddish brown. **Length**, pronotum and elytron: 3.30 mm.

**Female.** Same as male except: **Rostrum 0.96** as long as prothorax. Sternum 1 with median impression interrupted (basal and apical), convex in apical 2/3; impression in basal 1/3, moderately deep, broad, not deeper apically, continued shallowly on sternum 2. Sternum 2 medially impressed, with impression narrow, shallow. Sternum 5 with median subapical and pair of subbasal lateral impressions, with apicomedian area transversely concave; with basal area transversely subcostate; with median impression moderately deep, broad, transverse; with lateral impression moderately deep, small; **subequal** to median impression in depth; without tubercles. **Length**, pronotum and elytra: 4.20 mm.

**Genitalia and associated structures.** -- **Male.** **Median lobe** with dorsal surface excluding orificial area, fully sclerotized; with ventral surface fully sclerotized; widest at orifice, tapering toward base; elongate, with extreme apex subacute, narrowly rounded, slightly subapically constricted, slender in lateral view, tapering and narrowly rounded; with dorsolateral angulate ridge extending from orifice to basal margin; with dorsobasal margin distinct, deeply emarginate; with ventrobasal margin distinct, with short basal plate extending between apodemes, visible from above; ventrally with slight concavity at apex; with dorsal surface behind orifice poorly sclerotized, orifice apparently elongate-oval (i.e., pseudo-orifice produced), with proximal margin of pseudo-orifice distinct, arcuate, with pseudo-orifice large, quadrate, about 1/3 length of median lobe. Orifice more or less oval; with proximal margin distinct, markedly sclerotized. **Apodemes** long, 0.93 as long as median lobe. **Internal sac.** Orificial sclerites distinct, arcuate, forming pair of long lateral plates; internal sac with numerous fine spicules and scattered, large, acute spicules. **Female.** **Sternum VIII** with apical setae numerous, short, slender; arms broad and triangular, divergent, with inner margins more or less straight, with outer margins broadly, shallowly emarginate; fenestral area open, triangular. **Apodemes** broadly divergent from apical 1/3, narrowly separated to base. **Spermatheca.** Ramus prominent, markedly extending past insertion of spermathecal duct, set off from body by marked emargination. Nodulus produced, sinuate. **Gonocoxae** long, robust, with apex rounded, glabrous apically (or setae not distinguishable); with styli distinct, apicolaterally inserted. **Bursa copulatrix** with diamond-shaped, medially invaginated, convex sclerite. **Tergum VIII** rounded, hemispherical, not raised to form narrow marginal carina; apicolaterally not at all swollen, with lateral margins slightly inflexed ventrolaterally. **Pygidium** with apex truncate.

**Intraspecific Variation.** -- Varies greatly in size, robustness, and the color pattern of the scales. Often evenly mottled, tan-white and black, and without evident fasciae. At times strongly fasciate-maculate with black and brown maculae and white fasciae and maculae. Rarely the maculae and fasciae are nearly completely concealed by an earthen coating. Size range 3.10 -

**4.30 mm.**

**Remarks and Comparative Notes.** -- This relatively large Japanese species could be confused with *B. youngi* and *B. ryukyuensis*. *B. youngi* has a shorter rostrum, ca. 0.94 as long as the prothorax, and has the antennae inserted just behind the apical 1/3 of the rostrum. *B. ryukyuensis* has small tibial denticles, and a very broad lunate fascia that is not interrupted even on the elytral suture.

**Notes on Type Specimen.** -- The type series was studied by the junior author, K. Morimoto.

**Biological Note.** -- No data are available.

**Type Locality.** -- Japan, Honshū, Wakamatsu.

**Range.** -- Hokkaidō, Honshū, Kyūshū, Shikoku, Japan; Korea (according to published records).

**Material Examined.** -- **12** non-paratypes. [JAPAN: Honshu:] Japan G. Lewis 1910-320. Koga (1, BMNH); / Kobe. (1, BMNH); (Honshu) Nigachi Miyagi-cho Miyagi Pref. 25.vii.1977 T. Watanabe (1, KU); Campus Doito 10.IX.1969 / Banka Univ. Takasaka Saitama / Inst. Zool. P.A.N. Warszawa 8/69 (1, MWA); (Honshu) Sadayoshiguchi Miyagi-cho Miyagi Pref. 19.viii.1978 T. Watanabe (1, CWOB; 1, KU); Tokoname Aichi Pref. 3.VIII.1976 H. Tsuzuki / (Japanese characters) (**11**, KU); (Honshū) Tsu, Mie Pref. 11.VII.1981 R. Kishimoto (1, CWOB; 2, KU); [**Kyūshū**:] (Kyūshū) Kanra, Amakusa, 12.IX.1979, Okuhara (1, CWOB); [**Shikoku**:] (Shikoku) Mt. Kajigamori Kochi Pref. 20.vii.1952 K. Morimoto (1, KU).

### Bagous proprius group.

This species group is characterized by: diminutive dorsal process of median lobe; dorsal process projecting almost horizontally and lacking setal brush; dorsal surface broadly sulcate behind dorsal process, producing distinctly costate lateral margin; apodemes very short, only slightly curved; dorsal basal margin truncate.

The group is named after the Japanese species described herein. An undescribed Indian species also belongs to this group (distinct on the basis of genitalia, at least).

*Bagous proprius* O'Brien & Morimoto, new species.

Figures 17-18, 46, 53.

**DESCRIPTION** -- *Holotype male*. -- Body medium sized, elongate-oval, moderately slender. **Rostrum** moderately long, 0.89 as long as prothorax; black; subcylindrical; with dorsal curvature moderate and even; with ventral curvature weak and even; not more distinctly depressed toward apex; with median basal carina lacking; with apical median carina lacking; with basolateral sulcus deep, narrow, long, coarsely punctate; with ventral margin not angulate, not carinate; with sides subparallel, weakly expanding to apex; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales dense in basal 2/3, not granulate, contiguous, finely pitted, round, metallic, more evidently pitted in basal 1/3, sparser in apical 1/3,

nongranulate, not contiguous, not pitted, oval, metallic; without numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; with coarse rugose punctures visible beneath scales in basal 1/2, with punctures becoming sparser and finer apically. Head weakly convex; with swelling beside eye lacking; with eyes moderately convex; with scales coarsely granulate, contiguous, finely pitted, round, grey-brown and white; with plumose scales whitish, on articulating area. Supraocular setae few, short, distinct, suberect, curved, coarse, seta like, linearly arranged. Frons without submedian setae; broad, 0.61 as wide as head across eyes, somewhat flattened, shallowly impressed, indistinctly set off from rostrum by shallow impression; with median fovea, fovea moderately deep, small. Antennae inserted just in front of apical 1/3, inserted laterally; scape long, moderately slender, subclavate; scape and funicle reddish brown; funicle moderately short, 0.68 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club short, broad-oval, 0.55 as long as funicle, reddish black. Pronotum transverse, 0.87 as long as broad; with sides subparallel, moderately expanding from base; with apical constriction strong, in apical 1/5, dorsally distinct and uniform, moderately rounded behind constriction, with sides not impressed somewhat behind constriction; with median sulcus distinct, narrow, complete, forming subapical and subbasal impressions, with subbasal impression small, distinct, shallow; with apical impression very small, distinct, deep; with median carina lacking; with disc transversely flattened, not undulate, rugulose; with apical and marginal setae lacking; with carina of basal margin indistinct, in median 1/2; with scales coarsely granulate and rugulose, pitted, non-contiguous, round, blackish brown; with 3 vittae, with median vitta very narrow, complete, distinct, straight, pale greyish brown; with lateral vitta moderately broad, obliquely angled, pale greyish brown; not maculate on disc; with sides pale greyish brown, with indefinite blackish brown maculae; with ocular lobes strongly developed, reddish brown. Prosternal sulcus moderately shallow, broad, strongly narrowed at apical constriction, biangulate; with side margins moderately raised, with lateral margin just in front of coxae (lateral view) subacute. Elytra subparallel behind humeri to declivity, with declivity at 60 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices nonacuminate, conjointly slightly emarginate; with humeri well-developed, obliquely rounded, somewhat produced; with basal margin swollen, slightly to markedly costate from scutellum to, or almost to humerus; with odd intervals more convex and elevated, broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae inconspicuous, subrecumbent, curled, fine, pale whitish, each surrounded by scales of same color as other scales; even numbered intervals unevenly flattened, interval 2 not impressed; disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedeclytival swelling of 3rd interval weakly-developed, but evident; declivital callus of 5th interval weakly developed, subangulate, calli of intervals 3 and 5 unequal in size; confluence of intervals 3 and 9 slightly swollen; striae grooves distinct, moderately deep, narrow, with punctures small, moderately elongate, narrow, shallow, not wider than striae grooves; scales subgranulate, contiguous, finely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, brown, and greyish white; maculate; humeri pale whitish brown; antedeclytival callus or area of interval 3 with greyish white macula; declivital callus or area of interval 5 greyish white; otherwise with uneven dark brown, pale brown and greyish white maculae and scarcely evident short oblique posthumeral fascia; cuticle reddish black. Abdominal sterna with punctures small. Sternum 1 with median impression continuous for entire length, moderately deep, broad, not deeper apically, not continued on sternum 2; apical margin weakly declivous; 1.44 as long

as 2; suture between 1 & 2 bisinuate, broadly finely incised medially, deep laterally. Sternum 2 flattened, with transverse row of scarcely evident (often denuded) subrecumbent coarse setae, apical margin moderately declivous, not impressed on declivity, 1.50 as long as 3 & 4 together. Sternum 5 with pair of subbasal lateral impressions; with apicomedian area flat; basally transversely subcostate; without tubercles; with lateral impressions moderately deep, narrow and elongate; with one pair of apicolateral setae, with setae suberect, coarse, 1.42 as long as 3 & 4 together, 0.94 as long as 2, 0.65 as long as 1. Legs moderately long; femora clavate, black, with basal half reddish brown. Tibiae moderately slender, reddish brown, with inner margin weakly bisinuate, with outer margin moderately arcuate toward apex (in lateral view); with apices not narrowed; with inner surface with denticles 1 to several, indistinct, small, with few inconspicuous bristles on inner surface, with short, inconspicuous bristles on outer surface; with uncus moderately long, moderately stout, subequal to width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with 1 very small denticle, with 1 or 2 short setae on inner surface. Tarsi moderately long, sublinear, reddish brown, tarsomeres 1-3 slightly widened toward apex; tarsomere 3 not wider at apex than 2, sublinear, truncate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally finely pubescent; claws reddish brown. **Length**, pronotum and elytron: 2.25 mm.

**Allotype female.** Same as male except: **Rostrum 0.96** as long as prothorax, with dorsal curvature strong and uneven, with ventral curvature moderate and even, strongly depressed in apical 1/2. **Pronotum 0.93** as long as broad. Sternum 1 with median impression in basal 1/4 only, moderately deep, broad; convex in apical 3/4. Sternum 5 with pair of subbasal lateral impressions only; with basal area transversely subcostate; with lateral impression moderately deep, large. **Length**, pronotum and elytra: 2.50 mm.

**Genitalia and associated structures.** -- **Male. Median lobe** with dorsal surface excluding orifice and area behind dorsal process, fully sclerotized; with ventral surface fully sclerotized; widest at orifice, abruptly constricted behind dorsal process; with extreme apex broadly and uniformly rounded, robust in lateral view, tapering and narrowly rounded; with post-orificial dorsal process directed horizontally apicad, without evident setal brush; with dorsal surface behind dorsal process with broad, shallow depression, with lateral margin behind dorsal process markedly acute; with dorsal surface behind dorsal process membranous in small oval area; with dorsal surface convex but depressed, producing lateral costa from orifice to midlength; with dorsobasal margin distinct, truncate; with ventrobasal margin distinct, deeply emarginate. Orifice more or less oval, short; with proximal margin concealed by dorsal process. **Apodemes** slender, of more or less uniform width; short, curving inward, 0.14 as long as median lobe. **Internal sac.** Orificial sclerites lacking; internal sac lacking distinct teeth or concentrations of spicules. **Female. Sternum VIII** with apical setae numerous, long, mixed robust and bifid; arms broad, parallel, basally fused, apically broadly fused, with inner margins broadly, shallowly arcuate, with outer margins broadly, shallowly emarginate; fenestral area closed, oval. Apodemes moderately divergent near apex only, narrowly separated to base. **Spermatheca.** Ramus distinct, extending slightly past insertion of spermathecal duct, set off from body by marked emargination. Nodulus more or less uniformly, slightly convex. **Gonocoxae** short, slender, broadest about middle, with apex rounded, glabrous apically (or setae not distinguishable); with styli distinct, apicolaterally inserted. **Bursa copulatrix** simple, without sclerites. **Tergum VIII** slightly longer than wide at base; with apical margin bluntly rounded, narrowly reflexed, forming distinct lip; apicolaterally not at all swollen, with lateral margins not at all inflexed ventrolaterally. **Pygidium** with apex

**truncate.**

**Intraspecific Variation.** -- With little variation other than a dense earthen coating on one specimen concealing the color pattern. Size range 2.10 - 2.75 mm.

**Etymological Note.** -- This epithet is based on the Latin adverb *proprius* (= special, particular) and refers to the special and characteristic male median lobe of this species.

**Remarks and Comparative Notes.** -- A medium-sized species not likely to be confused with any other from Japan. It is much smaller than the very elongate slender *B. buckinghami* which also has linear to sublinear tarsi and the latter also lacks the distinct maculations of this species.

**Biological Note.** -- No data are available.

**Type Locality.** -- Japan, Honshii.

**Notes on Type Specimen(s).** -- Holotype (by designation) male (dissected), with the following labels: 1) [rectangular; whitish; printed in black ink with one yellow horizontal line] Japan. G. Lewis 1910-320 2) [rectangular; whitish; printed in black ink] Kobe. 3) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1992 4) [rectangular; red; printed in black ink] HOLOTYPE Bagous proprius O'Brien & Morimoto 1994. Point mounted. Right middle leg missing. Deposited in the Natural History Museum, London, England.

**Range.** -- Honshii, Japan.

**Material Examined.** -- Holotype, allotype and 2 paratypes. [JAPAN:] Japan G. Lewis 1910-320. / Ichiuchi 30.IV.-2.V.81. (1, KU); [Honshū:] Japan G. Lewis 1910-320. / Kobe. (holotype, allotype., BMNH; 1, CWOB).

### **Bagous fractus group.**

This species group is characterized by; median lobe with dorsal process; median lobe with apex elongate, distinctly asymmetrically deflected to left; apodemes of median lobe short; ventral surface of median lobe markedly bicarinate; median lobe dorsally depressed behind dorsal process, with indistinctly carinate sublateral margin behind dorsal process; sternum VIII of females with apodemes only slightly divergent apically, arms broadly fused apically, with large fenestra.

The group is 'based on and presently contains only the species *B. fructus*, but extralimital taxa may also belong here. While the principal median lobe characters will probably be possessed by other members of the group, it is quite possible that characters of sternum VIII will not.

*Bagous fractus* O'Brien & Morimoto, new species.

Figures 19-20, 38, 48, 57.

DESCRIPTION -- *Holotype male*. -- Body medium sized, moderately broadly elongate-oval, moderately robust. **Rostrum** moderately short, 0.88 as long as prothorax; black, with apex reddish brown; broadly subcylindrical; with dorsal curvature moderate and uneven; with ventral curvature weak and **even**; moderately depressed in apical 1/2; with median basal carina lacking; with apical median carina lacking; with basolateral sulcus moderately developed, broad, short, coarsely **punctate**; with ventral margin subangulate, not **carinate**; with sides unevenly subparallel, evenly, not quadrately expanding from just behind antennal insertion to apex; **scrobe** visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales dense in basal 2/3, subgranulate, contiguous, finely pitted, round, metallic, more coarsely subgranulate and pitted in basal 1/3, sparser in apical 1/3, nongranulate, not contiguous, finely pitted, oval, metallic; without numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; with coarse rugose punctures visible beneath scales in basal 1/2, with punctures becoming sparser and finer apically. **Head** strongly convex; with swelling beside eye very weak; with eyes weakly convex; with scales granulate, contiguous, coarsely pitted, round, grey-brown and white; with plumose scales yellowish, on articulating area. Supraocular setae few, short, distinct, suberect, curved, slender, **seta** like, linearly arranged. Frons without submedian setae; broad, 0.65 as wide as head across eyes, somewhat flattened, indefinitely shallowly impressed, not set off from rostrum by impression; with median fovea, fovea deep, large. **Antennae** inserted at apical 1/3, inserted laterally; scape moderately short, moderately slender, subclavate; scape and funicle reddish brown; funicle moderately short, 0.86 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club broad-oval, 0.57 as long as funicle, reddish brown. **Pronotum** transverse, 0.89 as long as broad; with sides sinuately subparallel, very weakly expanding from base; with apical constriction moderate, in apical 1/5, dorsally distinct and uniform, weakly rounded behind constriction, with sides slightly impressed behind round area; with median sulcus indistinct, narrow, incomplete, of uniform depth and width or almost so; with disc transversely flattened, not undulate, not rugose or rugulose; with apical and marginal setae few, scarcely evident, short, suberect, curved, fine; with carina of basal margin lacking; with scales coarsely granulate, coarsely pitted, subcontiguous, round, dark brownish black; with 3 vittae, with median vitta very narrow, complete, distinct, straight, pale greyish brown; with lateral vitta narrow, strongly curved, pale greyish brown; not maculate on disc; with sides pale brown, with indefinite blackish brown maculae; with ocular lobes moderately developed, reddish brown. **Prosternal sulcus** moderately deep, broad, strongly narrowed at apical constriction, biangulate; with side margins moderately raised, with lateral margin just in front of coxae (lateral view) rounded. **Elytra** subparallel, sinuate behind humeri to declivity, with declivity at 60 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices subacuminate, conjointly slightly emarginate; with humeri well-developed, obliquely angulate, somewhat produced; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals more convex and elevated, broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae inconspicuous, subrecumbent, curled, coarse, pale whitish, each surrounded by scales of same color as other scales; even numbered intervals weakly convex to flat, interval 2 not impressed;

disc weakly transversely angulately impressed across basal  $1/3$ , disc not undulating; antedeclivital swelling of 3rd interval lacking; declivital callus of 5th interval weakly developed, subangulate; confluence of intervals 3 and 9 slightly swollen; striae grooves distinct, deep, narrow, with punctures small, moderately elongate, narrow, deep, not wider than striae grooves; scales subgranulate, contiguous, finely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, brown, whitish and black, maculate; humeri with moderately large white macula; antedeclivital callus or area of interval 3 with white macula; declivital callus or area of interval 5 with small white macula; otherwise with brown, black, and white maculae, and subfasciate on side margins; cuticle black and reddish black. **Abdominal sterna** with punctures small. Sternum 1 with median impression in basal  $1/3$  only, deep, broad; convex in apical  $2/3$ ; apical margin not declivous; 1.20 as long as 2; suture between 1 & 2 bisinuate, broadly finely incised medially, deep laterally. Sternum 2 flattened, with transverse row of scarcely evident (often denuded) subrecumbent coarse setae, apical  $1/2$  steeply declivous, not impressed on declivity, 1.85 as long as 3 & 4 together. Sternum 5 with pair of subbasal lateral impressions; with apicomedian area flat; basally flat; with lateral impressions very shallow, small; with two pairs of apicolateral setae, with setae suberect, coarse, 1.38 as long as 3 & 4 together, 0.90 as long as 2, 0.75 as long as 1. **Legs** moderately short; femora clavate, reddish brown. Tibiae moderately slender, reddish brown, with inner margin strongly bisinuate, with outer margin moderately arcuate toward apex (in lateral view); with apices not narrowed; with inner surface with denticles few, distinct, stout, with few inconspicuous bristles on inner surface, with short, inconspicuous bristles on outer surface; with uncus moderately short, moderately stout, shorter than width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with 3 small denticles, with 1 or 2 short setae on inner surface. **Tarsi** moderately short, sublinear, reddish black, tarsomeres 1-3 slightly widened toward apex; tarsomere 3 not wider at apex than 2, sublinear, truncate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally finely pubescent; claws reddish brown. **Length**, pronotum and elytron: 2.20 mm.

**Allotype female.** Same as male except: **Rostrum** 1.00 as long as prothorax. **Antennae** inserted just behind apical  $1/3$ . **Pronotum** 0.76 as long as broad. Hind tibiae with 1 very small denticle. Sternum 1 with median impression in basal  $1/4$  only, moderately deep, broad; convex in apical  $3/4$ . Sternum 2 apical margin moderately declivous. **Length**, pronotum and elytra: 2.60 mm.

**Genitalia and associated structures.** -- **Male. Median lobe** with dorsal surface excluding orifice and area behind dorsal process, fully sclerotized; with ventral surface fully sclerotized; distinctly asymmetrical toward apex; widest at orifice; elongate, with extreme apex broadly and uniformly rounded, slightly subapically constricted, very slightly explanate, very slender in lateral view, tapering and narrowly rounded; with post-orificial dorsal process directed vertically, with setal brush situated anteromedially; with dorsal surface behind dorsal process with broad, deep depression; with dorsal surface behind dorsal process membranous in broad oval area; with dorsolateral furrow extending from depression behind dorsal process to basal margin or nearly so; with lateral margin behind orifice slightly compressed and concave; with dorsobasal margin distinct, deeply emarginate; with ventrobasal margin distinct, deeply emarginate; ventrally prominently medially raised, bicarinate from base to below orifice. Orifice triangular, elongate; with proximal margin concealed by dorsal process. **Apodemes** robust; very short, curving inward, 0.13 as long as median lobe. **Internal sac.** Orificial sclerites lacking and without internal structures. **Female. Sternum VIII** with apical setae lacking, with few very short conical sensilla;

arms broad, parallel, apically broadly fused, with inner margins broadly, shallowly arcuate, with outer margins broadly, shallowly emarginate; fenestral area closed, oval. **Apodemes** slightly divergent at extreme apex only, contiguous to base. **Spermatheca**. Ramus indistinct, not extending past insertion of spermathecal duct, set off from body by shallow emargination. Nodulus more or less uniformly, slightly convex. **Gonocoxae** long, slender, with apical 1/2 markedly narrowed, with apex oblique, glabrous apically (or setae not distinguishable); with styli distinct, apicolaterally inserted. **Bursa copulatrix** simple, without sclerites. **Tergum VIII** rounded, almost hemispherical; with apical margin medially slightly truncate, not raised to form narrow marginal carina; apicolaterally slightly angulately swollen, with lateral margins slightly inflexed ventrolaterally. **Pygidium** with apex truncate.

**Intraspecific Variatidn.** -- A relatively uniform species lacking significant variation. Size range 2.20 - 2.60 mm.

**Etymological Note.** -- This epithet is based on the Latin participle, **fractus** (= broken), which refers to the clearly interrupted prothoracic sulcus in this species.

**Remarks and Comparative Notes.** -- This species may be confused easily with **B. fritodes**. However the pronotum of the latter is ca. 9/10 as long as broad and the ventral margin of the rostrum is subangulate only, not subcarinate. The genitalia will separate the species readily, if necessary in doubtful cases.

**Biological Note.** -- No data are available.

**Type Locality.** -- Japan, Shikoku Jinzenji, Kochi City.

Notes on **Type Specimen(s)**. -- Holotype (by designation) male (dissected), with the following labels: 1) [rectangular; white; printed in black ink] (Shikoku) Jinzenji Kochi City 23.vii.1953 K. Morimoto 2) [rectangular; yellow; printed in black ink] Property of Entomol. Lab., Kyushu Univ. 3) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1991 4) [rectangular; red; printed in black ink] HOLOTYPE *Bagous fractus* O'Brien & Morimoto 1994. Point mounted. Tarsus missing from right hind leg. Deposited in Kyushu University, Fukuoka, Japan. Type number 2913.

**Range.** -- Honshū, Shikoku, Japan.

**Material Examined.** -- Holotype, allotype and 4 paratypes. [JAPAN:] Japan G. Lewis 1910.-320. (1, BMNH); [Honshū:] Aichi Pref. Yakusa, Toyota, 13-19-IX- 1990 K. Yamagishi YPT (**sic**) (1, CWOB); (Honshū) Matsushima Miyagi Pref. 8.vi. 1980 T. Watanabe (1, KU); Japan G. Lewis 1910.-320./ Niigata 4.IX.-16.IX.81./15/9/81 [underside of card mount] (1, CWOB; **allotype**, BMNH); [Shikoku:] (Shikoku) Jinzenji Kochi City 23.vii.1953 K. Morimoto (**holotype**, KU).

### ***Bagous buckinghami* group.**

This species group is characterized by: body medium-sized, elongate-subcylindrical, moderately slender; tarsi slender and linear; median lobe with apex blunt, asymmetrically deflected to left from just behind midpoint; median lobe with dorsal process, and with apodemes short and incurved; females with gonocoxa sinuate, lacking stylus; arms of sternum VIII slender, distinctively shaped (see Fig. 52), and lacking setae; spermatheca with fairly distinct ramus.

Presently we are not familiar with any other species that could be assigned to this group.

There are other species or species groups with a similar body *facies* or scale type and color, but none that have similar genitalia.

*Bagous buckinghami* O'Brien & Morimoto, new species.

Figures 21-22, 37, 52, 55.

**DESCRIPTION -- Holotype male.** -- Body medium sized, elongate subcylindrical, moderately slender. Rostrum moderately short, 0.89 as long as prothorax; reddish brown; subcylindrical; with dorsal curvature weak and uneven; with ventral curvature nearly straight; moderately depressed in apical 1/2; with median basal carina lacking; with basolateral carina lacking; with apicolateral carina lacking; with apical median carina lacking; with basolateral sulcus shallow, narrow, short, coarsely punctate; with ventral margin not angulate, not carinate; with sides parallel, slightly widened at antennal insertion; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales dense in basal 1/2, subgranulate, contiguous, pitted, oval, greyish brown, more coarsely subgranulate and pitted basally, subglabrous apically, nongranulate, not contiguous; without numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; coarsely densely punctate, with punctures becoming sparser and finer apically. Head moderately convex; with swelling beside eye weak; with eyes moderately convex; with scales granulate, contiguous, pitted, round, grey-brown and white; with plumose scales whitish, on articulating area. Supraocular setae few, very short, indistinct, suberect, curved, slender, seta like, linearly arranged. Frons without submedian setae; broad, 0.44 as wide as head across eyes, somewhat flattened, shallowly impressed, not set off from rostrum by impression; with median fovea, fovea deep, large. Antennae inserted just in front of middle, inserted laterally; scape moderately short, moderately stout, clavate; scape and funicle reddish brown; funicle moderately short, 0.84-1.04 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club broad-oval, 0.68 as long as funicle, reddish black. Pronotum transverse, 0.95 as long as broad; with sides markedly bisinuate subparallel, not expanding from base; with apical constriction moderate, in apical 1/6, without longitudinal carinae, dorsally distinct and uniform, weakly rounded behind constriction, with sides slightly impressed behind round area, lacking pit near margin of prosternal sulcus; with median sulcus lacking; with disc transversely flattened, not undulate, not rugose or rugulose; with apical and marginal setae lacking; with carina of basal margin indistinct, in median 1/3; with scales granulate, pitted, subcontiguous, round, brownish; with 2 vittae; with lateral vitta narrow, obliquely angled, pale greyish; not maculate on disc; with sides brown, with indefinite whitish maculae and vittae; with ocular lobes moderately developed, reddish brown. Prosternal sulcus moderately deep, broad, strongly narrowed at apical constriction, biangulate; with side margins moderately raised, with lateral margin just in front of coxae (lateral view) rounded. Elytra subparallel behind humeri to declivity, with declivity at 60 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices subacuminate, conjointly moderately emarginate; with humeri well-developed, weakly obliquely angulate, not at all projecting; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals not more convex nor elevated, not broader than even intervals, with interval 3 more or less uniformly elevated;

with odd numbered intervals with setae inconspicuous, recumbent, curled, coarse, pale whitish, each surrounded by scales of same color as other scales; even numbered intervals flattened, interval 2 not impressed; disc not transversely angulately impressed across basal 1/3, disc not undulating; antedeclivital swelling of 3rd interval lacking; declivital callus of 5th interval well-developed, subquadrate; confluence of intervals 3 and 9 distinctly swollen; striae grooves distinct, moderately deep, narrow, with punctures minute, scarcely evident, elongate, narrow, deep, not wider than striae grooves; scales subgranulate, subcontiguous, finely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, brown, and greyish white; maculate; humeri without macula; antedeclivital callus or area of interval 3 without macula; declivital callus or area of interval 5 white; otherwise with indefinite whitish vittae, fasciae and maculae on brown base color; cuticle black. **Abdominal sterna** with punctures moderate in size. Sternum 1 with median impression continuous for entire length, moderately deep, broad, slightly narrowed apically, deeper apically, not continued on sternum 2; apical margin not declivous; 1.19 as long as 2; suture between 1 & 2 bisinuate, finely incised medially, deep laterally. Sternum 2 flattened, with transverse row of scarcely evident (often denuded) subrecumbent coarse setae, apical margin moderately declivous, not impressed on declivity, 1.60 as long as 3 & 4 together. Sternum 5 with pair of subbasal lateral impressions; with apicomedian area flat; basally transversely convex; without tubercles; with lateral impressions shallow, large; with two pairs of apicolateral setae, with setae suberect, coarse, 1.20 as long as 3 & 4 together, 0.75 as long as 2, 0.63 as long as 1. Legs moderately long; femora clavate, reddish brown. Tibiae moderately slender, reddish brown, with inner margin strongly bisinuate, with outer margin slightly arcuate toward apex (in lateral view); with apices not narrowed; with inner surface with denticles few, distinct, small, with few inconspicuous bristles on inner surface, with short, inconspicuous bristles on outer surface; with uncus long, moderately slender, longer than width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with 1 very small denticle, with 1 or 2 short setae on inner surface. Tarsi long, linear, reddish brown, tarsomeres 1-3 of uniform width toward apex; tarsomere 3 not wider at apex than 2, subcordate, truncate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally finely pubescent; claws yellowish. **Length**, pronotum and elytron: 3.15 mm.

*Allotype female.* Same as male except: **Rostrum** 0.94 as long as prothorax, with dorsal curvature moderate and uneven, more distinctly narrowed in front of antennal insertion. Frons moderately broad, 0.54 as wide as head across eyes. **Antennae** inserted just behind middle. Sternum 1 with median impression continuous for entire length, moderately shallow, broad, narrowed apically; 1.11 as long as 2. Sternum 5 with pair of subbasal lateral impressions only; with lateral impression very shallow, small. **Length**, pronotum and elytra: 3.45 mm.

*Genitalia and associated structures.* -- Male. **Median lobe** with dorsal surface excluding orifice and area behind dorsal process, fully sclerotized; with ventral surface fully sclerotized; widest at orifice, distinctly constricted behind dorsal process; elongate, more or less triangular, with extreme apex subtruncate, very bluntly rounded, slender in lateral view, tapering and narrowly rounded; with post-orificial dorsal process directed slightly basad, with setal brush situated anteromedially; with dorsal surface behind dorsal process with broad, shallow depression; with dorsal surface behind dorsal process membranous in broad oval area; with dorsobasal margin distinct, deeply emarginate; with ventrobasal margin distinct, deeply emarginate. Orifice triangular, elongate; with proximal margin concealed by dorsal process. Apodemes robust; very short, curving inward, 0.14 as long as median lobe. **Internal sac.** Orificial sclerites lacking and

without internal structures. **Female. Sternum VIII** with apical setae lacking, with numerous very short conical sensilla; arms slender, parallel, slightly basally fused, with inner margins more or less straight, with outer margins broadly, shallowly emarginate; fenestral area open, **elongate-narrow**. **Apodemes** slightly divergent at extreme apex only, narrowly separated to base. **Spermatheca**. Ramus prominent, markedly extending past insertion of spermathecal duct, set off from body by shallow emargination. Nodulus irregularly wrinkled. **Gonocoxae** long, very slender, with apical 1/2 markedly narrowed, apically sinuate, with apex rounded, glabrous apically (or setae not distinguishable); with styli lacking. **Bursa copulatrix** simple, without sclerites. **Tergum VIII** somewhat cordate; with apical margin medially slightly truncate, narrowly reflexed, forming distinct lip; apicolaterally slightly swollen, with lateral margins not at all inflexed ventrolaterally. **Pygidium** with apex truncate.

**Intraspecific Variation.** -- A uniform species with two common color forms, one silver grey with indistinct whitish maculae and fasciae, and the other pale brown with indistinct greyish white maculae and fasciae. Rarely this species has a large distinct antedecivital pale macula on the 3rd elytral interval. Size range 2.60 - 3.60 mm.

**Etymological Note.** -- This species is named in honor of our good friend and colleague, Dr. Gary R. Buckingham, who collected many of the type series and the information on the host plant of this species.

**Remarks and Comparative Notes.** -- This distinctive species should not be confused with any other in Japan. The slender, very elongate body will distinguish it from all others.

**Biological Note.** -- Four specimens were reared from pupae taken from petioles of *Nymphoides indica* (L.) O. Kuntze, Nymphaeaceae. Also numerous adults were collected feeding on the same plant species. One adult was collected on *Eurale ferox* Salisb., Nymphaeaceae.

**Type Locality.** -- Japan, Kyiishii, Miyazaki City.

**Notes on Type Specimen(s).** -- Holotype (by designation) male (dissected), with the following labels: 1) [rectangular; white; printed in black ink] (Kyushu) Miyazaki City 22.vii.1953 T. Yoshida leg. 2) [rectangular; yellow; printed in black ink] Property of Entomol. Lab., Kyushu Univ. 3) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1991 4) [rectangular; red; printed in black ink] HOLOTYPE Bagous buckinghami O'Brien & Morimoto 1994. Point mounted. Tarsus missing from right hind leg. Deposited in Kyushu University, Fukuoka, Japan. Type number 2914.

**Range.** -- Honshu, Kyiishii, Japan; Vietnam.

**Material Examined.** -- Holotype, allotype and 54 paratypes. [**JAPAN:**] Japan G. Lewis 1910-320. / Bagous sp. 1 ind [handwritten] (1, BMNH). [**Honshū:**] Hanazono near Kyoto, by M. Suzuki, 21-Oct-1921/ A3343 (1, CWOB; 1, KU); Japan: Hyogo Pref. Kakogawa City (nr. Kobe), Heiso, Yamada-ike 3 Aug. 1992; GRB-92-28.1, G.R. Buckingham; R.W. Pemberton; feeding *Nymphoides indica* (8, CWOB; 4, KU; 7, USNM) GRB-92-28.3 adult on *Eurale ferox* (1, USNM), GRB-92-28.1A Reared ex pupa in *Nymphoides indica* petioles (2, CWOB; 2, USNM); Japan: Hyogo Pref. Kakogawa City (nr. Kobe), Kanki-cho, Batoh-ike, 5 Aug. 1992 GRB-92-30.1, G.R. Buckingham; R.W. Pemberton; feeding *Nymphoides indica* (2, BMNH; 2, BPBM; 5 CWOB; 2, FSCA; 2, KU; 2, CMNC; 6, USNM); Lake Tega Chiba pref. 5-VI-1967 H. Yamazaki (1, KU); Tokoname Aichi Pref. 3.viii. 1976 M. Tsuzuki / [Japanese characters] (1, KU); [**Kyūshū:**] (Kyūshū) Miyazaki City 22.vii.1953 T. Yoshida leg. (**holotype**, **allotype**, 1, KU). [**VIETNAM:**] VIETNAM: REG. DE LUC-NAM (Tonkin) L. Blaise 29.VI.04 (date underside of label)/ MUSEUM PARIS (coll. Ph. François) Coll. L. BEDEL 1922 (1, MNHN), X.09. (date

underside of label) (2, MNHN).

### ***Bagous rotundatus* group.**

This species group is characterized by: body very rounded and broad-oval, rendering rotund appearance; median lobe distinctive, with relatively short dorsal process projecting a little proximally; with denticles inside dorsal process; with broad depression behind dorsal process; with angulate lateral margin extending from behind dorsal process to near apex; sublateral margin behind dorsal process angulate, sides behind dorsal process swollen; apodemes short and incurved.

We are not familiar with any extralimital species that can be assigned to this group.

### ***Bagous rotundatus* O'Brien & Morimoto, new species.**

Figures 23-24, 47.

**DESCRIPTION -- *Holotype male*.** -- Body medium sized, elongate broad-oval, moderately robust. **Rostrum** moderately long, 0.91 as long as prothorax; black, with apex reddish brown; subcylindrical; with dorsal curvature strong and uneven; with ventral curvature moderate and even; very slightly depressed in apical 1/2; with median basal carina lacking; with basolateral carina lacking; with apicolateral carina lacking; with apical median carina lacking; with basolateral sulcus scarcely evident, broad, long, coarsely punctate; with ventral margin not angulate, not carinate; with sides unevenly subparallel, moderately subquadrately expanded in apical 1/2; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales dense in basal 1/2, subgranulate, contiguous, pitted, round, whitish, more coarsely subgranulate and pitted basally, becoming sparser in apical 1/2, nongranulate, not contiguous, finely pitted, oval, metallic; with numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; with coarse rugose punctures visible beneath scales in basal 1/2, with punctures becoming sparser and finer apically. **Head** strongly convex; with swelling beside eye lacking; with eyes moderately convex; with scales coarsely granulate, contiguous, coarsely pitted, round, whitish; with plumose scales yellowish, on articulating area. Supraocular setae few, short, indistinct, subrecumbent, curved, coarse, seta like, in cluster near eyes. Frons without submedian setae; broad, 0.65 as wide as head across eyes, somewhat flattened, indefinitely shallowly impressed, not set off from rostrum by impression; with median fovea, fovea moderately deep, small. **Antennae** inserted just behind apical 1/3, inserted laterally; scape moderately long, moderately slender, subclavate; scape and funicle reddish black; funicle long, 0.75 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club broad-oval, 0.67 as long as funicle, reddish black. Pronotum transverse, 0.82 as long as broad; with sides bisinuate rounded, strongly rounded from base; with apical constriction moderate, in apical 1/7, without longitudinal carinae, dorsally distinct and uniform, weakly rounded behind constriction, with sides slightly impressed behind round area, lacking pit near margin of prosternal sulcus; with

median sulcus indistinct, narrow, incomplete, of uniform depth and width or almost so; with disc transversely moderately convex, not undulate, rugulose; with apical and marginal setae lacking; with carina of basal margin lacking; with scales coarsely granulate and rugulose, finely pitted, subcontiguous, round, black; with 3 vittae, with median vitta narrow, complete, distinct, straight, whitish; with lateral vitta broad, curved, whitish; not maculate on disc; with sides pale greyish brown, not visible; with ocular lobes strongly developed, reddish brown. **Prosternal sulcus** moderately deep, broad, weakly narrowed at apical constriction, moderately biangulate; with side margins moderately raised, with lateral margin just in front of coxae (lateral view) subacute. **Elytra** subparallel, sinuate behind humeri to declivity, with declivity at 60 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices subacuminate, conjointly slightly emarginate; with humeri well-developed, obliquely angulate, not at all projecting; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals more convex and elevated, broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae inconspicuous, subrecumbent, curled, coarse, pale whitish, each surrounded by scales of same color as other scales; even numbered intervals weakly convex to flat; disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedeclytival swelling of 3rd interval lacking; declivital callus of 5th interval weakly developed, subrectangular; confluence of intervals 3 and 9 slightly swollen; striae grooves distinct, moderately deep, narrow, with punctures small, round, narrow, not visible, not wider than striae grooves; scales granulate, contiguous, finely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, brown, whitish and black; fasciate-maculate; humeri pale whitish brown; antedeclytival callus or area of interval 3 without macula; declivital callus or area of interval 5 without macula; otherwise with three narrow transverse pale whitish uneven fasciae, and numerous brown to black variable-sized maculae; cuticle black. **Abdominal sterna** with punctures small. Sternum 1 with median impression continuous for entire length, deep, broad, not deeper apically, not continued on sternum 2; apical margin declivous; 1.42 as long as 2; suture between 1 & 2 bisinuate, uniformly deep. Sternum 2 flattened, with denuded, apical 1/2 steeply declivous, not impressed on declivity, 2.40 as long as 3 & 4 together. Sternum 5 with pair of subbasal lateral impressions; with apicomedian area flat; basally flat; without tubercles; with lateral impressions very shallow, small; with two pairs of apicolateral setae, with setae suberect, coarse, 2.40 as long as 3 & 4 together, 1.00 as long as 2, 0.71 as long as 1. Legs moderately short; femora clavate, reddish brown. Tibiae moderately stout, reddish brown, with inner margin strongly bisinuate, with outer margin slightly arcuate toward apex (in lateral view); with apices not narrowed; with inner surface with denticles few, distinct, stout, with several moderately short bristles on inner surface, with short, inconspicuous bristles on outer surface; with uncus moderately short, stout, shorter than width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with denticles like fore- and midtibiae, with similar number of setae as fore- and mid-tibiae. Tarsi short, sublinear, reddish black, tarsomeres 1-3 slightly widened toward apex; tarsomere 3 slightly wider at apex than 2, sublinear, truncate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally finely pubescent; claws reddish brown. **Length**, pronotum and elytron: 2.80 mm.

*Female not known.*

*Genitalia and associated structures.* -- Male. Median **lobe** with dorsal surface excluding orifice and area behind dorsal process, fully sclerotized; with ventral surface fully sclerotized; broadened behind dorsal process; with extreme apex very broadly subacute, slender in lateral

view, tapering and narrowly rounded, with post-orificial dorsal process directed slightly basad, with setal brush situated anteromedially; inner, open surface of dorsal process covered with dense area of denticles; with dorsal surface behind dorsal process with broad, deep furrow, extending almost to basal margin, with lateral margin behind dorsal process markedly acute; with dorsal surface behind dorsal process membranous in broad quadrate area; with dorsobasal margin distinct, deeply emarginate; with ventrobasal margin distinct, deeply emarginate. Orifice triangular, short; with proximal margin concealed by dorsal process. **Apodemes** robust; very short, curving inward and with extreme apex sinuate, 0.14 as long as median lobe. **Internal sac.** Orificial sclerites lacking and without internal structures.

**Intraspecific Variation.** -- Known from the holotype only.

**Etymological Note.** -- This epithet is based on the Latin participle, **rotundatus** (= rounded), which refers to the distinctly rounded sides of the pronotum and the overall rotund shape of the body.

**Remarks and Comparative Notes.** -- This distinctive species should not be confused with any other species from Japan. In addition to its rounded prothorax and elytra, it possesses a strongly curved rostrum, and has a very weakly developed declivital callus on elytral interval 5.

**Biological Note.** -- No data are available.

**Type Locality.** -- Japan, Kyūshū, Fukuoka Prefecture, Urano Tagawa City.

**Notes on Type Specimen(s).** -- Holotype (by designation) male (dissected), with the following labels: 1) [rectangular; white; printed in black ink] (Kyushu) Urano Tagawa City Fukuoka Pref. 13.vi.1955 Y. Takakura 2) [rectangular; yellow; printed in black ink] Property of Entomol. Lab., Kyushu Univ. 3) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1991 4) [rectangular; red; printed in black ink] HOLOTYPE *Bagous rotundatus* O'Brien & Morimoto 1994. Point mounted. Tarsus missing from left front leg. Right hind leg glued on point. Deposited in Kyushu University, Fukuoka, Japan. Type number 2915.

**Range.** -- Fukuoka Prefecture, Kyūshū, Japan.

**Material Examined.** -- Holotype. [JAPAN: **Kyūshū:**] (Kyūshū) Urano Tagawa City Fukuoka Pref. 13.vi.1955 Y. Takakura (**holotype**, KU).

### ***Bagous transversus* group.**

This species group is characterized by; denticulate apicolateral surface of median lobe (below and distad of orifice); median lobe deeply incised laterally behind dorsal process (Fig. 49, li), and markedly constricted there; median lobe very slightly asymmetrical distad of orifice; inner surface of dorsal process denticulate, appearing to be “open” above, and projecting distad; apodemes short, markedly incurved.

This group presently includes *B. transversus* LeConte (North America), *B. youngi*, described herein, and one (or possibly two) undescribed species from India. The North American species is almost transcontinental in distribution and is common in collections, therefore the species group name is based on it.

***Bagous youngi*** O'Brien and Morimoto, new species.  
 Figures 25-26, 49, 54.

**DESCRIPTION** -- *Holotype male*. -- Body medium sized, elongate broad-oval, robust. Rostrum moderately long, 0.94 as long as prothorax; reddish brown; subcylindrical; with dorsal curvature strong and uneven; with ventral curvature weak and even; moderately depressed in apical 1/3; with median basal carina lacking; with apical median carina lacking; with basolateral sulcus deep, narrow, long, coarsely punctate; with ventral margin weakly subangulate, not carinate; with sides unevenly subparallel, evenly, not quadrately expanding from just behind antennal insertion to apex; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales dense in basal 2/3, subgranulate, contiguous, finely pitted, oval, greyish brown, more coarsely subgranulate and pitted basally, sparser in apical 1/3, nongranulate, not contiguous, pitted, oval, metallic; with numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; with dense coarse rugose elongate punctures, with punctures becoming sparser and finer apically. **Head** weakly convex; with swelling beside eye weak; with eyes moderately convex; with scales granulate, contiguous, coarsely pitted, round, grey-brown and white; with plumose scales whitish, on articulating area. Supraocular setae few, short, distinct, suberect, curved, coarse, seta like, linearly arranged. Frons without submedian setae; very broad, 0.70 as wide as head across eyes, somewhat flattened, shallowly impressed, indistinctly set off from rostrum by shallow impression; with median fovea, fovea shallow, small. **Antennae** inserted just behind apical 1/3, inserted laterally; scape long, moderately slender, subclavate; scape and funicle reddish brown; funicle short, 0.60 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club broad-oval, 0.66 as long as funicle, reddish brown. **Pronotum** transverse, 0.82 as long as broad; with sides sinuately subparallel, not expanding from base; with apical constriction moderate, in apical 1/6, dorsally distinct and uniform, weakly rounded behind constriction, with sides slightly impressed behind round area; with median sulcus lacking; with disc transversely weakly convex, not undulate, rugulose; with apical and marginal setae moderate in number, moderately distinct, short, suberect, curved, coarse; with carina of basal margin lacking; with scales coarsely granulate and rugulose, pitted, subcontiguous, round, blackish brown; with 3 vittae, with median vitta narrow, complete, distinct, straight, whitish brown; with lateral vitta broad, strongly curved, pale whitish-brown; not maculate on disc; with sides whitish brown, with indefinite subbasal and subapical, dark maculae; with ocular lobes moderately developed, reddish brown. **Prosternal sulcus** moderately deep, broad, strongly narrowed at apical constriction, biangulate; with side margins moderately raised, with lateral margin just in front of coxae (lateral view) rounded. **Elytra** subparallel behind humeri to declivity, with declivity at 45 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices subacuminate, conjointly moderately emarginate; with humeri well-developed, obliquely angulate, not at all projecting; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals more convex and elevated, broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae conspicuous, suberect, curled, coarse, pale whitish, each surrounded by scales of same color as other scales; even numbered intervals unevenly flattened, interval 2 weakly impressed; disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedeclytival swelling of 3rd interval lacking (though white maculae often appear raised); declivital callus of

5th interval weakly developed, subangulate; confluence of intervals 3 and 9 swollen; striae grooves distinct, moderately deep, narrow, with punctures small, round, narrow, deep, not wider than striae grooves; scales granulate, contiguous, coarsely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, brown, whitish and black; fasciate; humeri pale whitish brown; antedecivital callus or area of interval 3 with white macula; declivital callus or area of interval 5 white; otherwise with median area from base to declivity blackish brown, surrounded by broad sublunate brown to whitish fascia from humeri to declivity, remainder maculate brown and black; cuticle reddish brown and black. **Abdominal sterna** with punctures small. Sternum 1 with median impression in basal 1/2 only, moderately deep, broad; flattened in apical 1/2; apical margin not declivous; 1.44 as long as 2; suture between 1 & 2 bisinuate, uniformly deep. Sternum 2 flattened, with multiple transverse rows of evident (often denuded) subrecumbent coarse setae, apical 1/2 steeply declivous, not impressed on declivity, 1.67 as long as 3 & 4 together. Sternum 5 with median subapical and pair of subbasal lateral impressions; basally flat; with median impression very shallow, broad, transverse; with lateral impressions very shallow, small, subequal to median impression in depth; with two pairs of apicolateral setae, with setae suberect, coarse, 1.87 as long as 3 & 4 together, 1.12 as long as 2, 0.78 as long as 1. Legs moderately long; femora strongly clavate, reddish brown. Tibiae moderately stout, reddish brown, with inner margin weakly bisinuate, with outer margin moderately arcuate toward apex (in lateral view); with apices not narrowed; with inner surface with denticles several, distinct, stout, with moderately long bristles on inner surface, with short, moderately distinct bristles on outer surface; with uncus moderately short, stout, shorter than width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with denticles like fore- and midtibiae, with similar number of setae as fore- and mid-tibiae. Tarsi moderately short, sublinear, reddish brown, tarsomeres 1-3 slightly widened toward apex; tarsomere 3 not wider at apex than 2, sublinear, truncate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally with coarse scalelike long setae; claws reddish brown. **Length**, pronotum and elytron: 3.05 mm.

**Allotype female.** Same as male except: **Rostrum** 0.97 as long as prothorax, with dorsal curvature weak and even. Sternum 1 with median impression in basal 1/3 only, moderately shallow, broad; flattened in apical 2/3. Sternum 5 with pair of subbasal lateral impressions only, with apicomedian area flat; with basal area transversely subcostate; with lateral impression very shallow, small. **Length**, pronotum and elytra: 3.50 mm.

**Genitalia and associated structures.** -- **Male.** **Median lobe** with dorsal surface excluding orifice and area behind dorsal process, fully sclerotized; with ventral surface fully sclerotized; widest at orifice, abruptly constricted behind dorsal process; elongate, more or less triangular, with extreme apex subtruncate, very bluntly rounded, very slender in lateral view, declivous and with extreme apex upturned, narrowly rounded; with post-orificial dorsal process directed slightly apicad, with setal brush situated anteromedially; inner, open surface of dorsal process covered with dense area of denticles; with dorsal surface behind dorsal process with broad, shallow depression; with dorsal surface behind dorsal process membranous in broad oval area; with deep incision at base of dorsal process; with margin distad of orifice denticulate; with dorsobasal margin indistinct, deeply emarginate; with ventrobasal margin distinct, deeply emarginate; ventrobasally medially depressed. Orifice triangular, elongate; with proximal margin concealed by dorsal process. **Apodemes** robust; very short, curving inward, 0.12 as long as median lobe. **Internal sac.** Orificial sclerites lacking and without internal structures. **Female.** **Sternum VIII** with apical setae lacking, with few very short conical sensilla; arms slender, parallel, slightly

basally fused, with inner margins more or less straight, with outer margins broadly, shallowly emarginate; **fenestral** area open, elongate-narrow. **Apodemes** markedly divergent from ca. midlength, narrowly separated to base. **Spermatheca**. Ramus indistinct, not extending past insertion of spermathecal duct, with outline almost uniformly continuous with body. Nodulus more or less uniformly, slightly convex. **Gonocoxae** short, robust, constricted subapically, with apex rounded, glabrous apically (or setae not distinguishable); with styli distinct, apicolaterally inserted. **Bursa copulatrix** simple, without sclerites. **Tergum VIII** somewhat cordate; with apical margin somewhat produced medially, narrowly reflexed, forming distinct lip; apicolaterally slightly swollen, with lateral margins slightly inflexed ventrolaterally. **Pygidium** with apex truncate.

**Intraspecific variation.** -- Rarely almost uniformly silver-grey with scarcely evident maculae and fasciae, or with a dense earthen coating concealing color. Size range 2.90 - 3.75 mm.

**Etymological Note.** -- This species is named in honor of our friend and colleague, Dr. Frank N. Young, Jr., who collected several specimens of the type series.

**Remarks and Comparative Notes.** -- This species could be confused with *B. bipunctatus*, but the latter has the antennae inserted just in front of the apical 1/3 of the rostrum. It is quite similar to *B. ryukyuensis* which has small tibial denticles, and an uninterrupted lunate fascia which is complete across the sutural intervals. Also both of the latter two species have a rostrum clearly longer than the length of the prothorax.

**Biological Note.** -- Collected in a light trap.

**Type Locality.** -- Japan, Ryukyu Islands, Okinawa Island.

Notes **on Type Specimen(s).** -- Holotype (by designation) male (dissected), with the following labels: 1) [rectangular; white; printed in black ink] Okinawa Id June 11, 1945 FN Young No 29 2) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1991 3) [rectangular; red; printed in black ink] HOLOTYPE Bagous youngi O'Brien & Morimoto 1994. Point mounted. Deposited in the National Museum of Natural History, Washington, DC, USA.

**Range.** -- Honshū, Ryukyu Islands, Japan.

**Material Examined.** -- Holotype, allotype and 35 paratypes. [JAPAN: **Honshti:**] Lake Tega Chiba pref. 5-VI-1967 (2, BMNH; 4, CWOB; 13, KU; 2, USNM), 14-VIII-1967 (1, KU) H. Yamazaki; Mt. Iwawaki Osaka, Japan Light trap June.25.1966 H. Kimura (1, KU); Mt Takago (Chiba pref.) 12-VI-1964 H. Yamazaki (1, KU); (Honshii) Nigachi Miyagi-cho Miyagi Pref. 25.vii.1977 T. Watanabe (1, KU); (Honshū) Saikawa Marumori-cho Miyagi Pref. 21 .vii. 1980 T. Watanabe (1, CWOB; 1, KU). [**Ryukyu Islands:**] Nishinakama Amami, Ryukyu 1-7.VI.1970 H. Makiahara leg. (1, KU); Okinawa Id June 11, 1945 FN Young No. 29 (**holotype**, USNM; 2 CWOB), Aug 15, 1945 WD Field No. 36 (2, USNM), Aug. 20, 1945 WD Field No. 39 (2, USNM), Oct. 4, 1945 FN Young (**allotype**, USNM); (Ryukyus) Shimi Okinawa 4.VII.1959 O. Nakachi (1, KU).

**Bagous frit group.**

This species group is characterized by male genital characters only: median lobe T-shaped in cross-section, markedly constricted below; with dorsal process; dorsal surface flat behind dorsal process, distinctly narrowly depressed and markedly cleft immediately behind dorsal process, with margin of cleavage very finely denticulate; inner surface of dorsal process denticulate; apicolateral margin of median lobe denticulate below and slightly distad of orifice; apex very markedly asymmetrically deflected to left and asymmetrically explanate; apodemes short and markedly incurved.

This group is based on the European species, *B. frit* (Herbst), which closely resembles the following Japanese species in genital characters. The median lobe is truly extraordinary, while the female genital structure is not unusual. The female genitalia of *B. frirodes* are distinctive among Japanese species, but possess no characters that are unusual for the genus as a whole. We presently know of no other species belonging to this group.

*Bagous frirodes* O'Brien & Morimoto, new species.

Figures 27-28, 50, 56.

**DESCRIPTION** -- *Holotype mule*. -- Body medium sized, elongate-oval, moderately robust. **Rostrum** moderately long, 0.96 as long as prothorax; black, with apex reddish brown; subcylindrical; with dorsal curvature moderate and uneven; with ventral curvature nearly straight; moderately depressed in apical 1/3; with median basal carina lacking; with apical median carina lacking; with basolateral sulcus deep, narrow, short, coarsely punctate; with ventral margin subangulate, subcarinate; with sides subparallel, evenly, not quadrately expanding from just behind antennal insertion to apex; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales dense in basal 2/3, subgranulate, contiguous, finely pitted, oval, metallic, more coarsely subgranulate and pitted basally, sparser in apical 1/3, subgranulate, not contiguous, not pitted, oval, metallic; with numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; with coarse rugose punctures visible beneath scales in basal 1/2, with punctures becoming sparser and finer apically. **Head** weakly convex; with swelling beside eye weak; with eyes weakly convex; with scales coarsely granulate, contiguous, pitted, round, brownish; with plumose scales yellowish, on articulating area. Supraocular setae few, short, distinct, subrecumbent, curved, coarse, scale like, linearly arranged. Frons without submedian setae; broad, 0.64 as wide as head across eyes, somewhat flattened, indefinitely shallowly impressed, distinctly set off from rostrum by transverse impression; with median fovea, fovea shallow, small. **Antennae** inserted just behind apical 1/4, inserted laterally; scape long, slender, subclavate; scape and funicle reddish brown; funicle moderately long, 0.75 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club long, broad-oval, 0.67 as long as funicle, reddish black. **Pronotum** transverse, 0.77 as long as broad; with sides subparallel, not expanding from base; with apical constriction moderate, in apical 1/6, dorsally shallower medially, weakly rounded behind constriction, with sides not impressed somewhat behind constriction; with median sulcus indistinct, narrow, incomplete, of

uniform depth and width or almost so; with disc transversely flattened, not undulate, rugulose; with apical and marginal setae numerous, distinct, short, suberect, curved, coarse; with carina of basal margin lacking; with scales coarsely granulate and rugulose, coarsely pitted, subcontiguous, round, black; with 3 vittae, with median vitta narrow, complete, indefinite, straight, whitish brown; with lateral vitta narrow, obliquely angled, whitish; not maculate on disc; with sides whitish brown, with indefinite blackish brown maculae; with ocular lobes strongly developed, reddish brown. **Prosternal sulcus** deep, moderately broad, strongly narrowed at apical constriction, biangulate; with side margins moderately sharply raised, with lateral margin just in front of **coxae** (lateral view) rounded. Elytra subparallel, sinuate behind humeri to declivity, with declivity at 75 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices subacuminate, conjointly moderately emarginate; with humeri well-developed, obliquely angulate, somewhat produced; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals more convex and elevated, broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae conspicuous, subrecumbent, curled, coarse, pale whitish, each surrounded by scales of same color as other scales; even numbered intervals unevenly flattened, interval 2 not impressed; disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedecrivital swelling of 3rd interval lacking; declivital callus of 5th interval weakly developed, subquadrate; confluence of intervals 3 and 9 distinctly swollen; striae grooves distinct, deep, narrow, with punctures small, moderately elongate, narrow, deep, not wider than striae grooves; scales subgranulate, contiguous to imbricate, coarsely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, black, brown, and white; maculate; humeri with white macula; antedecrivital callus or area of interval 3 with white macula; declivital callus or area of interval 5 white; otherwise with white, whitish, and black maculae on brown base color; cuticle reddish brown to black. **Abdominal sterna** with punctures small. Sternum 1 with median impression in basal 1/2 only, moderately deep, broad; convex in apical 1/2; apical margin weakly declivous; 1.33 as long as 2; suture between 1 & 2 bisinuate, broadly finely incised medially, deep laterally. Sternum 2 flattened, with transverse row of scarcely evident (often denuded) subrecumbent coarse setae, apical margin moderately declivous, not impressed on declivity, 2.00 as long as 3 & 4 together. Sternum 5 with pair of subbasal lateral impressions; with apicomedian area flat; basally transversely convex; without tubercles; with lateral impressions very shallow, large; with one pair of apicolateral setae, with setae suberect, coarse, 2.08 as long as 3 & 4 together, 0.96 as long as 2, 0.78 as long as 1. Legs moderately long; femora clavate, reddish brown. Tibiae moderately slender, reddish brown, with inner margin weakly bisinuate, with outer margin moderately arcuate toward apex (in lateral view); with apices not narrowed; with inner surface with denticles few, distinct, stout, with conspicuous short bristles on inner surface, with short, conspicuous bristles on outer surface; with **uncus** moderately long, moderately stout, subequal to width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with 2 small denticles, with 1 or 2 short setae on inner surface. Tarsi moderately long, sublinear, dark reddish, tarsomeres 1-3 slightly widened toward apex; tarsomere 3 not wider at apex than 2, sublinear, truncate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally finely pubescent; claws reddish brown. **Length**, pronotum and elytron: 2.80 mm.

*Allotype female.* Same as male except: **Rostrum** with dorsal curvature strong and even, with ventral curvature moderate and even. Frons broad, 0.71 as wide as head across eyes. **Antennae** inserted just behind apical 1/3. **Pronotum 0.89** as long as broad. **Length**, pronotum

and elytra: 3.20 mm.

**Genitalia and associated structures.** -- **Male, Median lobe** with dorsal surface excluding orifice and area behind dorsal process, fully sclerotized; with ventral surface fully sclerotized; markedly asymmetrical toward apex; more or less parallel-sided, slightly constricted behind dorsal process; elongate, with extreme apex very broadly subacute, distinctly subapically constricted, very asymmetrically explanate, slender in lateral view, declivous, narrowly rounded; with post-orificial dorsal process directed slightly basad, with setal brush situated anteromedially; inner, open surface of dorsal process covered with dense area of denticles; with dorsal surface behind dorsal process with narrow, tapering, deep furrow, with lateral margin behind dorsal process very markedly costate (costa projecting laterad); with dorsal surface behind dorsal process fully and uniformly sclerotized; with lateral margin behind orifice markedly compressed and deeply concave; with margin distad of orifice denticulate; with dorsobasal margin distinct, deeply emarginate; with ventrobasal margin distinct, deeply emarginate; ventrally prominently medially raised. Orifice triangular, elongate; with proximal margin concealed by dorsal process. **Apodemes** robust, tapering; short, curving inward, 0.14 as long as median lobe. **Internal sac.** Orificial sclerites lacking; internal sac lacking distinct teeth or concentrations of spicules. **Female.** **Sternum VIII** with apical setae few, very short, slender; arms slender, parallel, with inner margins sinuate, with outer margins broadly, shallowly emarginate; fenestral area open, elongate-narrow. **Apodemes** moderately divergent near apex only, narrowly separated to base. **Spermatheca.** Ramus indistinct, extending slightly past insertion of spermathecal duct, with outline almost uniformly continuous with body. Nodulus more or less uniformly, slightly convex. **Gonocoxae** long, robust, with apical 1/2 markedly narrowed, with apex oblique, glabrous apically (or setae not distinguishable); with styli distinct, apicolaterally inserted. **Bursa copulatrix** simple, without sclerites. **Tergum VIII** somewhat cordate; with apical margin distinctly produced medially, not raised to form narrow marginal carina; apicolaterally angulately swollen, with lateral margins markedly inflexed ventrolaterally. **Pygidium** with apex deeply emarginate.

**Intraspecific Variation.** -- A uniform species lacking significant variation. Size range 2.80 - 3.30 mm.

**Etymological Note.** -- This epithet is based on the combination of *B. frit*, a closely related species of *Bagous* from Europe, and the suffix, **-odes** (= like, resembling), and refers to the close resemblance of the morphology of the median lobes of these two species.

**Remarks and Comparative Notes.** -- This species is likely to be confused with *B. fractus*. However the pronotum of the latter is ca. 3/4 as long as broad, and the ventral margin of the rostrum is both subangulate and subcarinate. It is quite possible that a study of the genitalia may be necessary for a definitive identification.

**Biological Note.** -- No data are available.

**Type Locality.** -- Japan.

**Notes on Type Specimen(s).** -- Holotype (by designation) male (dissected), with the following labels: 1) [rectangular; whitish; printed in black ink with one yellow horizontal stripe] Japan. G.Lewis. 1910-320. 2) [rectangular; whitish; written in black ink] *Bagous*. sp. . . . i 2 ind. [with a line through "2 ind."] 2 or 3 ind 3) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1992 4) [rectangular; red; printed in black ink] HOLOTYPE *Bagous fritodes* O'Brien & Morimoto 1994. Point mounted. Deposited in the Natural History Museum, London, England.

**Range.** -- Hokkaidō, Honshū, Japan.

**Material Examined.** -- Holotype, allotype and 2 paratypes. [JAPAN:] Japan G. Lewis 1910.-320. / Bagous sp. .... 2 or 3 ind [handwritten] (1 CWOB; **holotype**, BMNH). [Hokkaidō:] Japan G. Lewis 1910.-320. / Hakodate. (**allotype**, BMNH); [Honshii:] Japan G. Lewis 1910.-320. / Kyoto 2.VII.4-.VII.81/ 2.7.81 [underside of card mount] (1, BMNH).

#### SPECIES NOT ASSIGNED TO GROUP.

Several of the Japanese *Bagous* presently cannot be assigned to species group. Each is distinctive in genital and/or external structure and is therefore distinct from other Japanese species. However, they are known only from female specimens. Other species known only from female specimens can be assigned to species group because they have characters that we consider synapomorphies for or within such groups. For example, *B. subcordatus*, described herein, is known only from female specimens, but it possesses several characters that suggest it is closely related to *B. bipunctatus*. Three other species, however, cannot be assigned to a group because the apomorphic states of external characters that they do possess are entirely equivocal and support assignment to any of several groups. Therefore we have no alternative but not to place them in any species group until male specimens become known, which will probably allow proper and unequivocal assignment. These species are presented alphabetically.

*Bagous lewisi* O'Brien & Morimoto, new species.

Figures 29-30, 64.

DESCRIPTION -- **Holotype female.** -- Body medium sized, elongate-oval, moderately robust. **Rostrum** moderately short, 0.89 as long as prothorax; black, with apex reddish brown; subcylindrical; with dorsal curvature moderate and uneven; with ventral curvature weak and even; moderately depressed in apical 1/3; with median basal carina lacking; with apical median carina lacking; with basolateral sulcus deep, narrow, long, coarsely punctate; with ventral margin angulate, subcarinate; with sides subparallel, evenly weakly expanding to apex; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales dense in basal 2/3, subgranulate, subcontiguous, finely pitted, oval, metallic, more coarsely subgranulate and pitted basally, sparser in apical 1/3, nongranulate, not contiguous, finely pitted, round, metallic; without numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; with small dense elongate punctures, with punctures becoming sparser and finer apically. **Head** weakly convex; with swelling beside eye lacking; with eyes moderately convex; with scales subgranulate, contiguous, coarsely pitted, round, brownish black and white; with plumose scales whitish, on articulating area. Supraocular setae few, short, distinct, subrecumbent, curved, slender, seta like, linearly arranged. Frons without submedian setae; broad, 0.66 as wide as head across eyes, weakly convex, not impressed, indistinctly set off from rostrum by shallow impression; with median fovea, fovea moderately deep, small. **Antennae** inserted just behind apical 1/3, inserted laterally; scape long, slender, subclavate; scape and funicle reddish brown; funicle moderately

short, 0.67 as long as **scape**, with segment 1 stout, segment 2 slender, 1 and 2 **subequal** in length, 3-6 short, 7 short and strongly transverse; club long, broad-oval, 0.67 as long as funicle, reddish brown. Pronotum transverse, 0.73 as long as broad; with sides unevenly subparallel, not expanding from base; with apical constriction moderate, in apical 1/5, dorsally shallower medially, weakly rounded behind constriction, with sides slightly impressed behind round area; with median sulcus distinct, narrow, complete, of uniform depth and width or almost so; with disc transversely flattened, not undulate, rugulose; with apical and marginal setae moderate in number, scarcely evident, short, suberect, curved, coarse; with **carina** of basal margin lacking; with scales coarsely granulate and rugulose, coarsely pitted, subcontiguous, round, blackish brown; with 3 vittae, with median vitta narrow, complete, distinct, straight, pale greyish brown; with lateral vitta narrow, curved, pale greyish brown; not maculate on disc; with sides pale greyish brown, with indefinite blackish brown maculae; with ocular lobes moderately developed, reddish brown. Prosternal **sulcus** moderately deep, moderately broad, strongly narrowed at apical constriction, biangulate; with side margins moderately sharply raised, with lateral margin just in front of **coxae** (lateral view) subacute. Elytra subparallel behind humeri to declivity, with declivity at 60 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices nonacuminate, conjointly rounded; with humeri well-developed, obliquely angulate, somewhat produced; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals more convex and elevated, broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae conspicuous, subrecumbent, curled, coarse, pale, each surrounded by scales of same color as other scales; even numbered intervals unevenly flattened, interval 2 not impressed, disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedeclivital swelling of 3rd interval weakly-developed, but evident; declivital callus of 5th interval well-developed, subquadrate, calli of intervals 3 and 5 unequal in size; confluence of intervals 3 and 9 slightly swollen; striae grooves distinct, moderately deep, narrow, with punctures small, round, narrow, deep, not wider than striae grooves; scales granulate, contiguous to imbricate, coarsely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, black, brown, and white; fasciate-maculate; humeri with white macula; antedeclivital callus or area of interval 3 with white macula; declivital callus or area of interval 5 white; otherwise with short oblique narrow whitish posthumeral fascia on intervals 4-8, and variable-sized black, brown and whitish maculae; cuticle reddish black to black. Abdominal sterna with punctures moderate in size. Sternum 1 with median impression in basal 1/4 only, shallow, broad; convex in apical 3/4; apical margin not declivous; 1.36 as long as 2; suture between 1 & 2 bisinuate, uniformly deep. Sternum 2 flattened, with pair of evident submedian suberect coarse setae, apical margin moderately declivous, not impressed on declivity, 2.08 as long as 3 & 4 together. Sternum 5 with median subapical and pair of subbasal lateral impressions; basally transversely subcostate; without tubercles; with median impression moderately deep, broad, subtriangular; with lateral impressions moderately deep, large, subequal to median impression in depth; with one pair of apicolateral setae, with setae suberect, coarse, 2.00 as long as 3 & 4 together, 0.96 as long as 2, 0.71 as long as 1. Legs moderately long; femora clavate, reddish brown, with apical fifth black. Tibiae moderately slender, reddish brown, with inner margin weakly bisinuate, with outer margin moderately arcuate toward apex (in lateral view); with apices not narrowed; with inner surface with denticles several, distinct, stout, with several moderately short bristles on inner surface, with short, inconspicuous bristles on outer surface; with uncus moderately long, moderately stout, subequal to width of tibial apex; hind

tibiae as strongly arcuate as fore- and midtibiae, with denticles like fore- and midtibiae, with similar number of setae as fore- and mid-tibiae. **Tarsi** moderately short, broad, dark reddish, tarsomeres 1-3 broadened toward apex; tarsomere 3 distinctly wider at apex than 2, subcordate, subemarginate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally finely pubescent; claws reddish brown. **Length**, pronotum and elytron: 3.00 mm.

**Male not known.**

**Genitalia and associated structures.** -- **Male** not known, **Female**, **Sternum VIII** with apical setae several, long, robust; arms broad, parallel, with inner margins broadly, shallowly arcuate, with outer margins broadly arcuate; fenestral area open, broad-oval. **Apodemes** broadly divergent near apex only, narrowly separated to base. **Spermatheca**. Ramus indistinct, not extending past insertion of spermathecal duct, with outline almost uniformly continuous with body. Nodulus more or less uniformly, slightly convex. **Gonocoxae** long, robust, with apex rounded, with apical setae few; with styli distinct, apicolaterally inserted. **Bursa copulatrix** simple, without sclerites. **Tergum VIII** rounded, hemispherical, narrowly reflexed, forming distinct lip; apicolaterally not at all swollen, with lateral margins not at all inflexed ventrolaterally. **Pygidium** with apex truncate.

**Intraspecific Variation.** -- Known from the holotype only.

**Etymological Note.** -- This species is named in honor of the well-known entomologist, Mr. George Lewis, from whose collection these species came.

**Remarks and Comparative Notes.** -- This species could be confused with *B. kagiashi* but the latter has a sulcate frons, the ventral margin of the rostrum not angulate nor carinate, and the antedecivital swelling of elytral interval 3 well-developed. *B. spiculatus* is similar but has the ventral margin of the rostrum distinctly angulate and carinate, and lacks an antedecivital swelling on elytral interval 3.

**Biological Note.** -- No data are available.

**Type Locality.** -- Japan.

**Notes on Type Specimen(s).** -- Holotype (by designation) female (dissected), with the following labels: 1) [rectangular; whitish; printed in black ink with one yellow horizontal stripe] Japan. G.Lewis.1910-320 2) [rectangular; whitish; written in black ink] Bagous. sp. 1 ind. 3) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1992 4) [rectangular; red; printed in black ink] HOLOTYPE Bagous lewisi O'Brien & Morimoto 1994. Point mounted. Deposited in the Natural History Museum, London, England.

**Range.** -- Japan.

**Material Examined.** -- Holotype. [JAPAN:] Japan G. Lewis 1910.-320. / Bagous sp 1 ind. [handwritten] (holotype, BMNH).

*Bagous subvittatus* O'Brien & Morimoto, new species.

Figures 31-32, 65.

**DESCRIPTION -- *Holotype female*.** -- Body medium sized, elongate-oval, moderately robust. **Rostrum** moderately long, 0.96 as long as prothorax; black, with apex reddish brown; subcylindrical; with dorsal curvature moderate and uneven; with ventral curvature moderate and even; moderately depressed in apical 1/3; with median basal carina lacking; with apical median carina lacking; with basolateral sulcus shallow, narrow, short, coarsely punctate; with ventral margin not angulate, not carinate; with sides unevenly subparallel, weakly subquadrately expanded in apical 1/3; **scrobe** visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute 'angle'; with scales moderately dense in basal 1/3, not granulate, not contiguous, coarsely pitted, oval, metallic, denuded, sparser apically, nongranulate, not contiguous, not pitted, elongate to oval, metallic; without numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; moderately coarsely densely punctate, with punctures becoming sparser and finer apically. **Head** moderately convex; with swelling beside eye lacking; with eyes moderately convex; with scales coarsely granulate, subcontiguous, coarsely pitted, round, brownish black and white; with plumose scales yellowish, on articulating area. Supraocular setae few, very short, indistinct, subrecumbent, curved, slender, seta like, linearly arranged. Frons without submedian setae; broad, 0.58 as wide as head across eyes, weakly convex, not impressed, not set off from rostrum by impression; with median sulcus, sulcus moderately deep, narrow, short. **Antennae** inserted at apical 1/4, inserted laterally; scape long, moderately slender, subclavate; scape and funicle dark reddish; funicle moderately long, 0.73 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club long, broad-oval, 0.57 as long as funicle, reddish black. **Pronotum** transverse, 0.89 as long as broad; with sides unevenly, weakly rounded, moderately expanding from base; with apical constriction moderate, in apical 1/6, dorsally shallower medially, moderately rounded behind constriction, with sides not impressed somewhat behind constriction; with median sulcus distinct, very narrow, complete, of uniform depth and width or almost so; with disc transversely flattened, not undulate, rugulose; with apical and marginal setae few, scarcely evident, very short, subrecumbent, curved, fine; with carina of basal margin strong, in median 3/5, sinuate; with scales coarsely granulate and rugulose, finely pitted, subcontiguous, round, dark brownish black; with 3 vittae, with median vitta very narrow, complete, distinct, straight, white; with lateral vitta moderately broad, curved, white; not maculate on disc; with sides brown, with indefinite blackish brown maculae; with ocular lobes strongly developed, reddish brown. **Prosternal sulcus** moderately shallow, moderately broad, strongly narrowed at apical constriction, biangulate; with side margins moderately raised, with lateral margin just in front of coxae (lateral view) subacute. **Elytra** subparallel behind humeri to declivity, with declivity at 45 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices nonacuminate, conjointly rounded; with humeri well-developed, obliquely angulate, somewhat produced; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals more convex and elevated, broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae conspicuous, subrecumbent, curled, fine, pale whitish, each surrounded by scales of same color as other scales; even numbered intervals weakly convex to flat, interval 2 not impressed; disc weakly transversely angulately impressed across basal 1/3, disc not undulating; antedeclytival

swelling of 3rd interval lacking; declivital callus of 5th interval very weakly developed, subangulate; confluence of intervals 3 and 9 swollen; striae grooves distinct, deep, narrow, with punctures small, elongate, narrow, deep, not wider than striae grooves; scales coarsely granulate, contiguous to imbricate, finely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, blackish brown and white; subvittate; humeri with white macula; antedecrivital callus or area of interval 3 with white macula; declivital callus or area of interval 5 white; otherwise subvittate, with short white vittae as extensions of lateral prothoracic vittae on base of fourth interval, white macula of humerus posteriorly extended on eighth interval connected with oblique white subfascia on seventh through fifth intervals behind middle (each subvitta separated by black striae), with brownish declivity, on blackish brown base color; cuticle reddish black to black. **Abdominal sterna** with punctures small. Sternum 1 with median impression in basal 1/3 only, very shallow, broad; flattened in apical 2/3; apical margin not declivous; 1.44 as long as 2; suture between 1 & 2 straight, broadly finely incised medially, deep laterally. Sternum 2 flattened, with transverse row of scarcely evident (often denuded) subrecumbent coarse setae, apically weakly declivous, not impressed on declivity, 1.53 as long as 3 & 4 together. Sternum 5 with pair of subbasal lateral impressions; with apicomedian area flat; basally flat; without tubercles; with lateral impressions shallow, small; with one pair of apicolateral setae, with setae suberect, coarse, 1.27 as long as 3 & 4 together, 0.83 as long as 2, 0.58 as long as 1. Legs moderately long; femora clavate, black, with basal half reddish brown. Tibiae moderately slender, reddish brown, basal half black, with inner margin strongly bisinuate, with outer margin moderately arcuate toward apex (in lateral view); with apices slightly narrowed; with inner surface with denticles few, indistinct, minute, with few inconspicuous bristles on inner surface, with short, inconspicuous bristles on outer surface; with uncus long, moderately stout, longer than width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with 1 very small denticle, with 1 or 2 short setae on inner surface. Tarsi long, sublinear, reddish brown, tarsomeres 1-3 slightly widened toward apex; tarsomere 3 not wider at apex than 2, sublinear, truncate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally finely pubescent; claws reddish brown. Length, pronotum and elytron: 2.20 mm.

**Male not known.**

**Genitalia and associated structures.** -- Male not known. Female. Sternum VIII with apical setae several, long, robust, with few very short conical sensilla; arms very broad, parallel, basally fused, with inner margins sinuate, with outer margins broadly arcuate; fenestral area open, elongate-narrow. **Apodemes** markedly divergent from ca. midlength, broadly separated to near base. **Spermatheca.** Ramus prominent, extending slightly past insertion of spermathecal duct, set off from body by shallow emargination. Nodulus irregularly wrinkled. **Gonocoxae** short, robust, with apex rounded, glabrous apically (or setae not distinguishable); with styli distinct, apicolaterally inserted. **Bursa copulatrix** simple, without sclerites. Tergum VIII rounded, almost hemispherical; with apical margin medially slightly truncate, very slightly reflexed but not forming distinct lip; apicolaterally not at all swollen, with lateral margins not at all inflexed ventrolaterally. **Pygidium** with apex truncate.

**Intraspecific Variation.** -- Known from the holotype only.

**Etymological Note.** -- This epithet is based on the Latin prefix, *sub-* (= somewhat, less than) in combination with the Latin adjective, *vittatus* (=longitudinal stripe, bearing vittae), and refers to the interrupted, pearlescent white, short, thoracic and elytral vittae.

**Remarks and Comparative Notes.** -- This species should not be confused with any others

if its distinctive subvittate color pattern is not denuded nor concealed by the waterproof coating. Only *B. kagiashi* has a similar strong transverse carina on the basal margin of the pronotum, but also has moderately short tarsi with tarsomere 3 distinctly wider at the apex than tarsomere 2.

**Biological Note.** -- No data are available.

**Type Locality.** -- Japan, Ryukyu Islands, Okinawa Island, Chinen.

**Notes on Type Specimen(s).** -- Holotype (by designation) female (dissected), with the following labels: 1) [rectangular; white; printed in black ink] RYUKYU IS. OKINAWA I., Chinen 5.V.1964 2) [rectangular; white; printed in black ink] T.Takara & T.Kakainohana Collectors 3) [rectangular; yellow; printed in black ink] U.S.-Japan Co-op. S.C. Programme 4) [rectangular; white; printed in black ink] BP Bishop Museum 5) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1992 6) [rectangular; red; printed in black ink] HOLOTYPE *Bagous subvittatus* O'Brien & Morimoto 1994. Point mounted. Tarsus missing from right front leg. Deposited in Bernice P. Bishop Museum, Honolulu, HI, USA.

**Range.** -- Ryukyu Islands, Japan.

**Material Examined.** -- Holotype. [JAPAN: Ryukyu Islands:] RYUKYU IS. OKINAWA I., Chinen 5.V.1964 / T. Tahara & T. Kakainohana Collectors (holotype, BPBM).

***Bagous tuberculosus* O'Brien & Morimoto, new species.**

Figures 33-34, 66.

DESCRIPTION -- **Holotype female.** -- Body medium sized, elongate-oval, moderately robust. **Rostrum** moderately long, 0.94 as long as prothorax; reddish black; subcylindrical; with dorsal curvature strong and uneven; with ventral curvature moderate and even; suddenly strongly depressed in apical 2/5; with median basal carina lacking; with basolateral carina lacking; with apical median carina lacking; with basolateral sulcus moderately developed, narrow, long, coarsely punctate; with ventral margin subangulate, not carinate; with sides subparallel, evenly weakly expanding to apex; scrobe visible from above only at point of insertion, basally with ventral margin straight or almost so, with ventral margin meeting rostral margin at very acute angle; with scales dense in basal 2/3, subgranulate, contiguous, pitted, round, whitish yellow, more coarsely subgranulate and pitted basally, becoming sparser in apical 1/2, nongranulate, not contiguous, finely pitted, oval, not metallic; without numerous, widely and uniformly spaced, subrecumbent, evident, curled setae; coarsely densely punctate, with punctures becoming sparser and finer apically. **Head** moderately convex; with swelling beside eye weak; with eyes moderately convex; with scales coarsely granulate, imbricate, coarsely pitted, round, grey-brown and white; with plumose scales yellowish, on articulating area. Supraocular setae few, short, distinct, subrecumbent, curved, coarse, scale like, in cluster near eyes. Frons without submedian setae; broad, 0.50 as wide as head across eyes, somewhat flattened, shallowly impressed, indistinctly set off from rostrum by shallow impression; with median sulcus, sulcus shallow, narrow, long. **Antennae** inserted just behind apical 1/3, inserted laterally; scape long, moderately slender, subclavate; scape and funicle reddish black; funicle short, 0.61 as long as scape, with segment 1 stout, segment 2 slender, 1 and 2 subequal in length, 3-6 short, 7 short and strongly transverse; club long, broad-oval, 0.91 as long as funicle, reddish black. **Pronotum** transverse, 0.90 as long as broad; with sides unevenly subparallel, very weakly expanding from base; with

apical constriction weak, in apical 1/7, without longitudinal carinae, dorsally distinct and uniform, weakly rounded behind constriction, with sides not impressed somewhat behind constriction, lacking pit near margin of prosternal sulcus; with median sulcus indistinct, very narrow, complete, of uniform depth and width or almost so; with disc transversely flattened, not undulate, not rugose or rugulose; with apical and marginal setae lacking; with carina of basal margin lacking; with scales coarsely granulate and subrugose, pitted, subcontiguous, round, black; with 3 vittae, with median vitta narrow, complete, distinct, straight, pale tan; with lateral vitta broad, obliquely angled, pale tan; not maculate on disc; with sides broadly whitish, with indefinite blackish brown maculae; with ocular lobes strongly developed, reddish brown. **Prosternal sulcus** deep, broad, weakly narrowed at apical constriction, moderately biangulate; with side margins moderately sharply raised, with lateral margin just in front of coxae (lateral view) subacute. **Elytra** subparallel, sinuate behind humeri to declivity, with declivity at 45 degrees (in relation to dorsal plane); markedly wider than prothorax; with apices nonacuminate, conjointly rounded; with humeri well-developed, obliquely angulate, subacutely produced; with basal margin more or less flat, at most slightly swollen adjacent to scutellum; with odd intervals very unevenly slightly more convex and elevated, broader than even intervals, with interval 3 more or less uniformly elevated; with odd numbered intervals with setae inconspicuous, subrecumbent, curled, coarse, pale whitish, each surrounded by scales of same color as other scales; even numbered intervals unevenly flattened, interval 2 weakly impressed; disc weakly transversely angulately impressed across basal 1/3, disc unevenly undulating; antedeclivital swelling of 3rd interval tuberculate; declivital callus of 5th interval well-developed, rounded, calli of intervals 3 and 5 unequal in size, antedeclivital swelling of 5th interval moderately developed, subtuberculate; confluence of intervals 3 and 9 distinctly swollen; striae distinct, deep, narrow, with punctures minute, scarcely evident, not visible, not visible, not visible; scales granulate, subcontiguous, coarsely pitted, round, arranged irregularly, usually with 3 or more scales across intervals, black, brown, and tan; fasciate; humeri without macula; antedeclivital callus or area of interval 3 without macula; declivital callus or area of interval 5 without macula; otherwise with intervals 1-3 black from base to declivity, remaining area pale tan to brown, with some blackish maculae; cuticle black. **Abdominal sterna** with punctures moderate in size. Sternum 1 with median impression in basal 1/4 only; flattened in apical 3/4; apical margin not declivous; 1.25 as long as 2; suture between 1 & 2 straight, broadly fused medially, deep laterally. Sternum 2 convex, with multiple transverse rows of evident (often denuded) subrecumbent coarse setae, apical margin moderately declivous, not impressed on declivity, 1.60 as long as 3 & 4 together. Sternum 5 with median subapical and pair of subbasal lateral impressions; basally transversely subcostate; without tubercles; with median impression shallow, broad, transverse, without carinate margins; with lateral impressions shallow, small, slightly deeper than median impression; with two pairs of apicolateral setae, with setae suberect, coarse, 1.10 as long as 3 & 4 together, 0.69 as long as 2, 0.55 as long as 1. **Legs** moderately long; femora clavate, reddish black. Tibiae moderately slender, reddish brown, with inner margin weakly bisinuate, with outer margin moderately arcuate toward apex (in lateral view); with apices not narrowed; with inner surface with denticles 1 to several, indistinct, minute, with few indistinct short bristles on inner surface, with short, moderately distinct bristles on outer surface; with uncus long, moderately stout, longer than width of tibial apex; hind tibiae as strongly arcuate as fore- and midtibiae, with 1 very small denticle, with 1 or 2 short setae on inner surface. Tarsi moderately long, sublinear, reddish brown, tarsomeres 1-3 slightly widened toward apex; tarsomere 3 slightly wider at apex than 2,

sublinear, subemarginate; tarsomeres ventrally with sparse to dense, subrecumbent to recumbent pubescence, dorsally finely pubescent; claws reddish brown. **Length**, pronotum and elytron: 3.35 mm.

*Male not known.*

*Genitalia and associated structures.* -- **Male** not known. **Female**, **Sternum VIII** with apical setae numerous, long, robust, with few very short conical sensilla; arms very broad, divergent, slightly basally fused, with inner margins more or less straight, with outer margins broadly arcuate; fenestral area open, triangular. **Apodemes** broadly divergent from apical 1/3, narrowly separated to base. **Spermatheca**. Not known. **Gonocoxae** short, robust, broadest about middle, with apex rounded, glabrous apically (or setae not distinguishable); with styli distinct, apicolaterally inserted. **Bursa copulatrix** simple, without sclerites. **Tergum VIII** more or less quadrate; with apical margin broadly truncate, very slightly reflexed but not forming distinct lip; apicolaterally not at all swollen, with lateral margins not at all inflexed ventrolaterally. **Pygidium** with apex broadly blunted, forming flat, thickened, arcuate margin.

*Intraspecific Variation.* -- Known from the holotype only.

*Etymological Note.* -- This epithet is based on the Latin adjective, *tuberosus* (= with lumps or protuberances), which refers to the antedeclivital elytral swellings on intervals 3 and 5, the latter not present in any other known Japanese species.

*Remarks and Comparative Notes.* -- This species is not likely to be confused with any other from Japan. In addition to the tuberculate antedeclivital swelling of elytral interval 3, it possesses a distinctive subtuberculate antedeclivital swelling on elytral interval 5, the latter not present in any other species from the region.

*Biological Note.* -- No data are available.

*Type Locality.* -- Japan, Shikoku, Tokushima Prefecture, Uetsuno Jinryo-son.

Notes on *Type Specimen(s)*. -- Holotype (by designation) female (dissected), with the following labels: 1) [rectangular; white; printed in black ink] (Shikoku) Uetsuno Jinryo-son Tokushima Pref. 10.viii.1949 I.Hiura leg. 2) [rectangular; yellow; printed in black ink] Property of Entomol. Lab., Kyushu Univ. 3) [rectangular; white; handprinted in black ink] NO SPERMATHECA 4) [rectangular; pink with black margins; printed in black ink] DRAWN Askevold 1991 5) [rectangular; red; printed in black ink] HOLOTYPE Bagous tuberculosus O'Brien & Morimoto 1994. Point mounted. Deposited in Kyushu University, Fukuoka, Japan. Type number 2916.

*Range.* -- Tokushima Prefecture, Shikoku, Japan.

*Material Examined.* -- Holotype. [**JAPAN: Shikoku:**] (Shikoku) Uetsuno Jinryo-son Tokushima Pref. 10.viii. 1949 I. Hiura (**holotype**, KU).

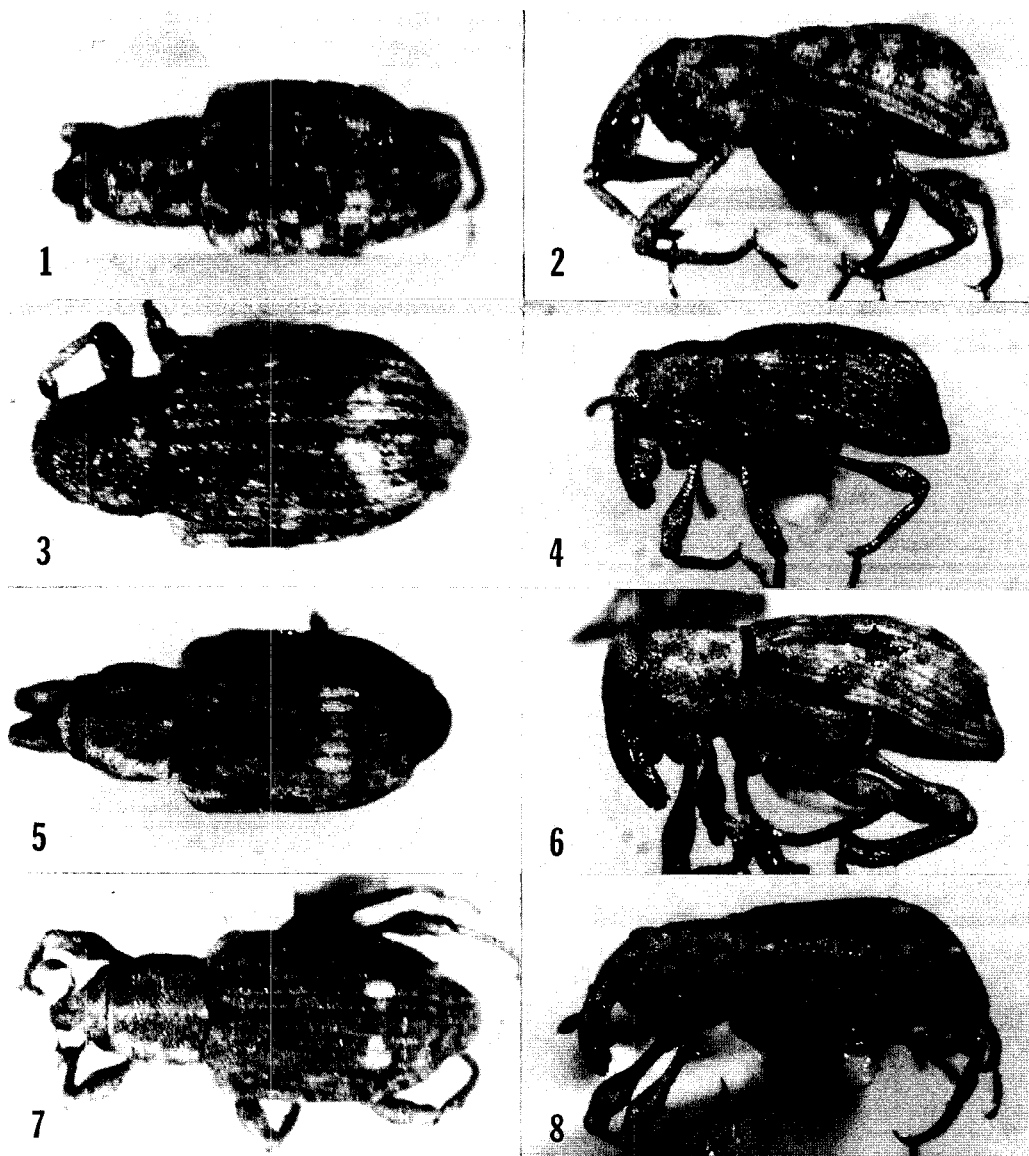
## ACKNOWLEDGMENTS.

We would like to thank the curators (named in Materials) for loan of specimens on which this study is based. We also owe Drs. Robert S. Anderson, Horace B. Burke, and James Pakaluk many thanks for their helpful comments on and criticism of this manuscript.

Research leading to this publication was supported in part by a grant #58-43YK-9-0011 ARS (Agricultural Research Service, U.S.D.A.), and a grant FLAX 850006 from CSRS (Cooperative State Research Service, U.S.D.A.). Research on the part of I.S. Askevold was supported also in part by a Natural Sciences and Engineering Research Council of Canada Post-Doctoral Fellowship.

## REFERENCES CITED.

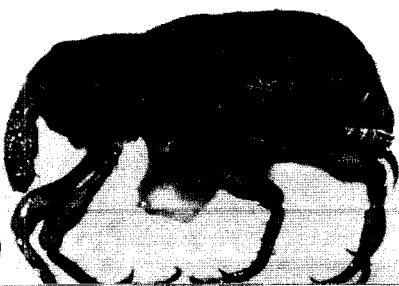
- Arnett, R.H., Jr. and G.A. Samuelson, 1969. Directory of Coleoptera Collections of North America (Canada through Panama). Cushing - Malloy, Inc., Ann Arbor, vii + 1-123 pp.
- Askevold, I.S. and C.W. O'Brien. 1994. DELTA, an Invaluable Computer Program for Generation of Taxonomic Monographs. *Annals of the Entomological Society of America* 87(1):1-16.
- Askevold, I.S., C.W. O'Brien and K. Morimoto. 1994. Systematics and evolution of weevils of the genus *Bagous* Germar (Coleoptera: Curculionidae) III. Phylogenetic analysis of the species known from Japan. *Esakia* 34:75-129.
- Chûjô, M. and K. Morimoto. 1959. Curculionid-beetles of Niigata Prefecture collected by Dr. K. Baba (2nd report). *Kontyû* 27:146-155.
- Dallwitz, M.J. and T.A. Paine, 1986. User's Guide to the DELTA System. A General System for Processing Taxonomic Descriptions, 3rd Ed. CSIRO Division of Entomology Report No. 13.
- Germar, E.F. 1817. [Note], in *Miscellaneen und Correspondenz - Nachrichten*. *Magazin der Entomologie* (Halle) 2:339-341.
- Heppner, J.B. and G. Lamas, 1982. Acronyms for world museum collections of insects, with an emphasis on Neotropical Lepidoptera. *Bulletin of the Entomological Society of America* 28:305-315.
- Kôno, H. 1934. Die Japanischen Hylobiinen (Col. Curc.). *Journal of the Faculty of Agriculture, Hokkaido Imperial University* XxX111(3):223-249.
- Lindroth, C.H. 1957. The principal terms used for male and female genitalia in Coleoptera. *Opuscula Entomologica* 22:241-256.
- O'Brien, C.W. and I.S. Askevold, 1992. Systematics and evolution of weevils of the genus *Bagous* Germar (Coleoptera: Curculionidae), I. Species of Australia. *Transactions of the American Entomological Society* 118:331-452.
- Partridge, T.R., M.J. Dallwitz and L. Watson, 1988. A Primer for the DELTA System on MS-DOS and VMS, 2nd Ed. CSIRO Division of Entomology Report No. 38.
- Schönherr, C.J. 1826. *Curculionidum disposito methodica cum generum characteribus, descriptionibus atque observationibus variis, seu prodromus ad synonymiae insectorum*. Fleischer, Lipsiae. *Partem 4, X* [+ 1. "Corrigenda", "Notificatio"] + 338 pp.



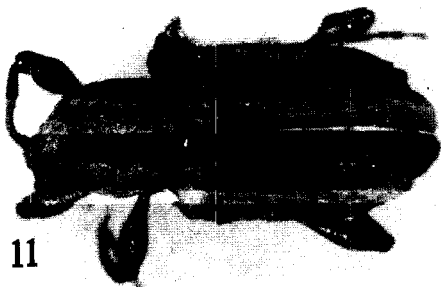
FIGURES 1-8. Photographs of: 1, 2, *B. minor*; 3, 4, *B. pygmaeodes*; 5, 6, *B. ryukyuensis*; 7, 8, *B. kagiashi*.



9



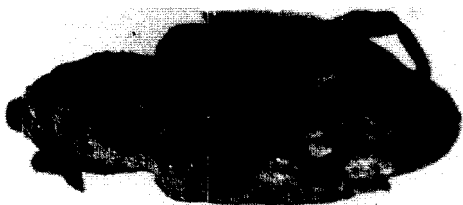
10



11



12



13



14

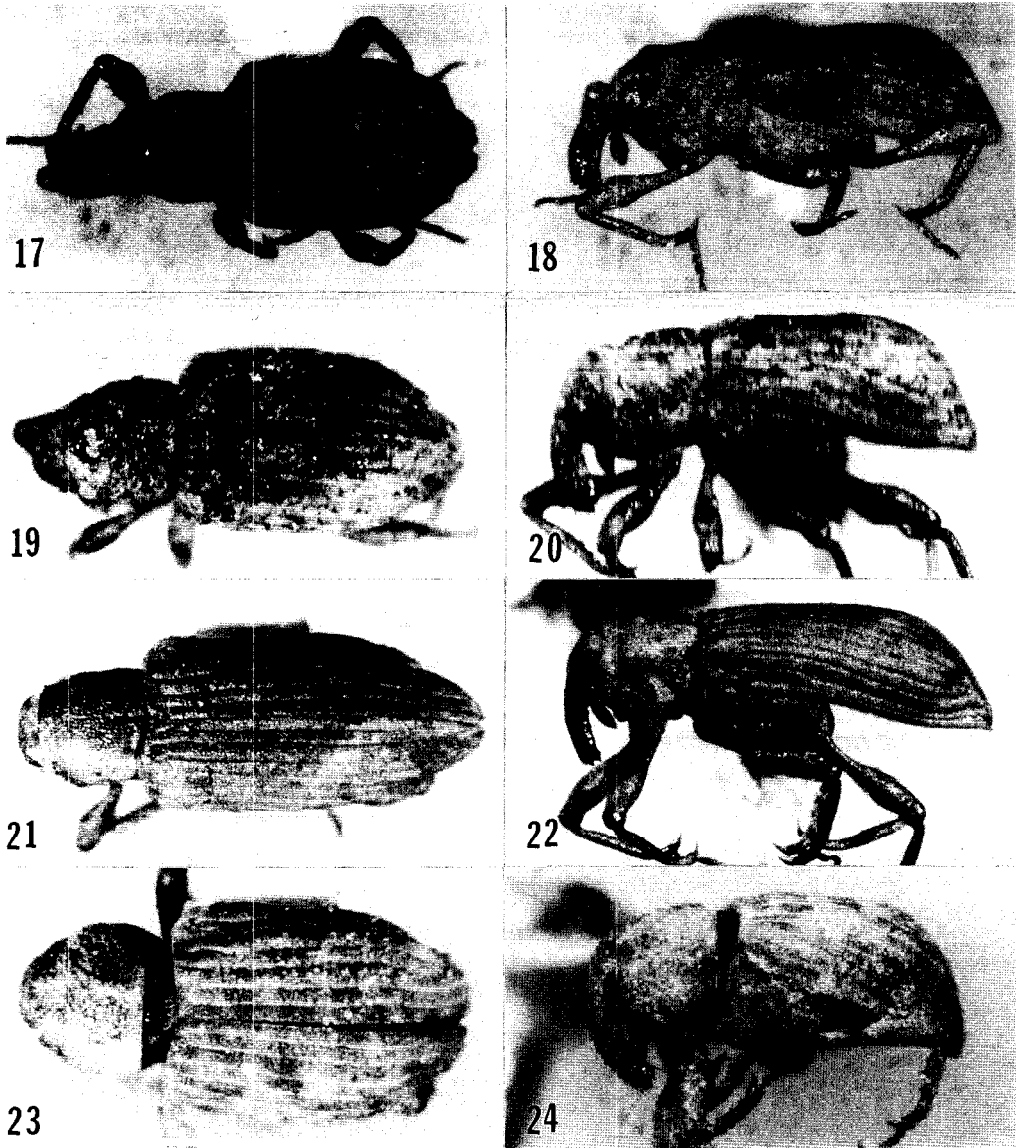


15

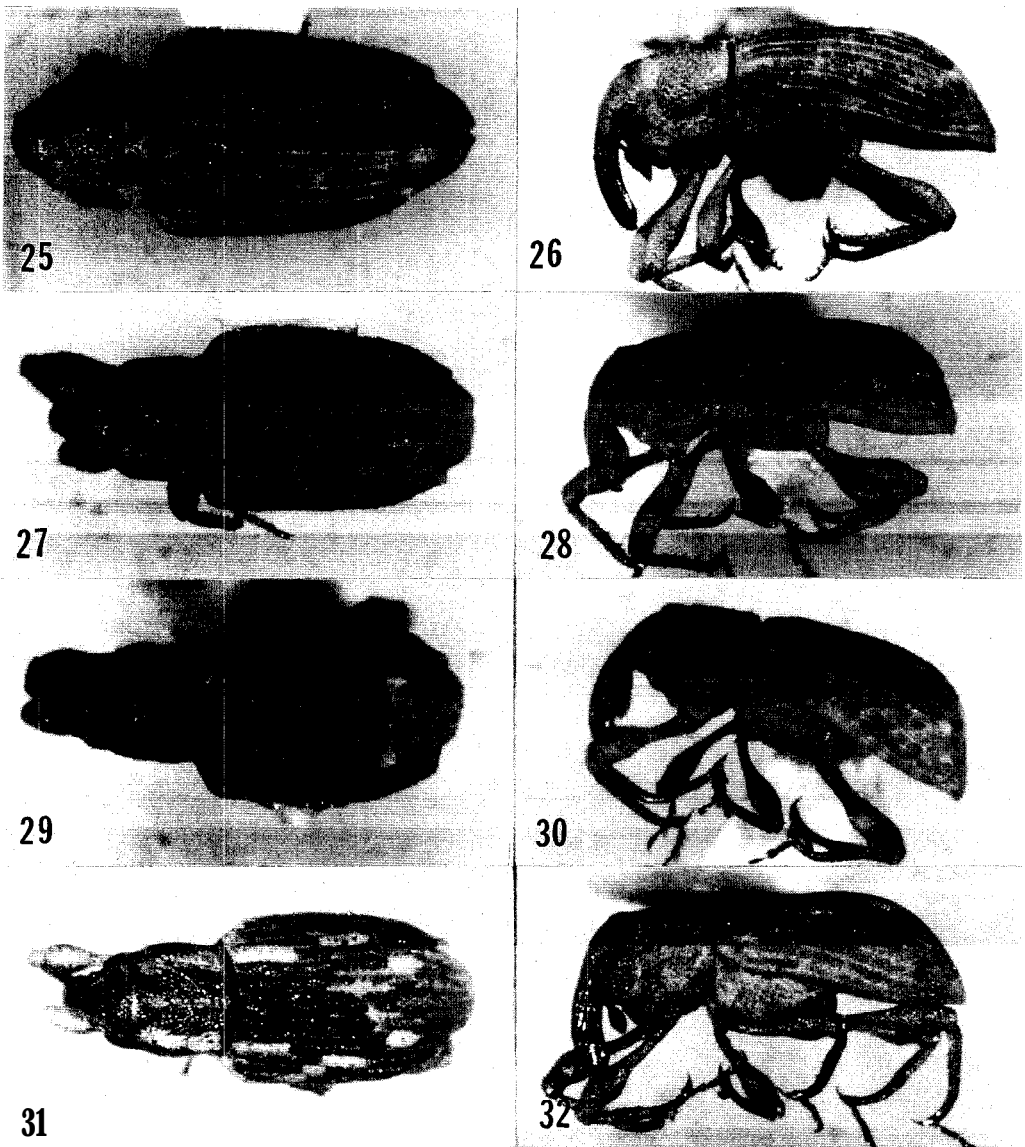


16

**FIGURES 9-16.** Photographs of: 9, 10, *B. spiculatus*; 11, 12, *B. occultus*; 13, 14, *B. subcordatus*; 15, 16, *B. bipunctatus*.



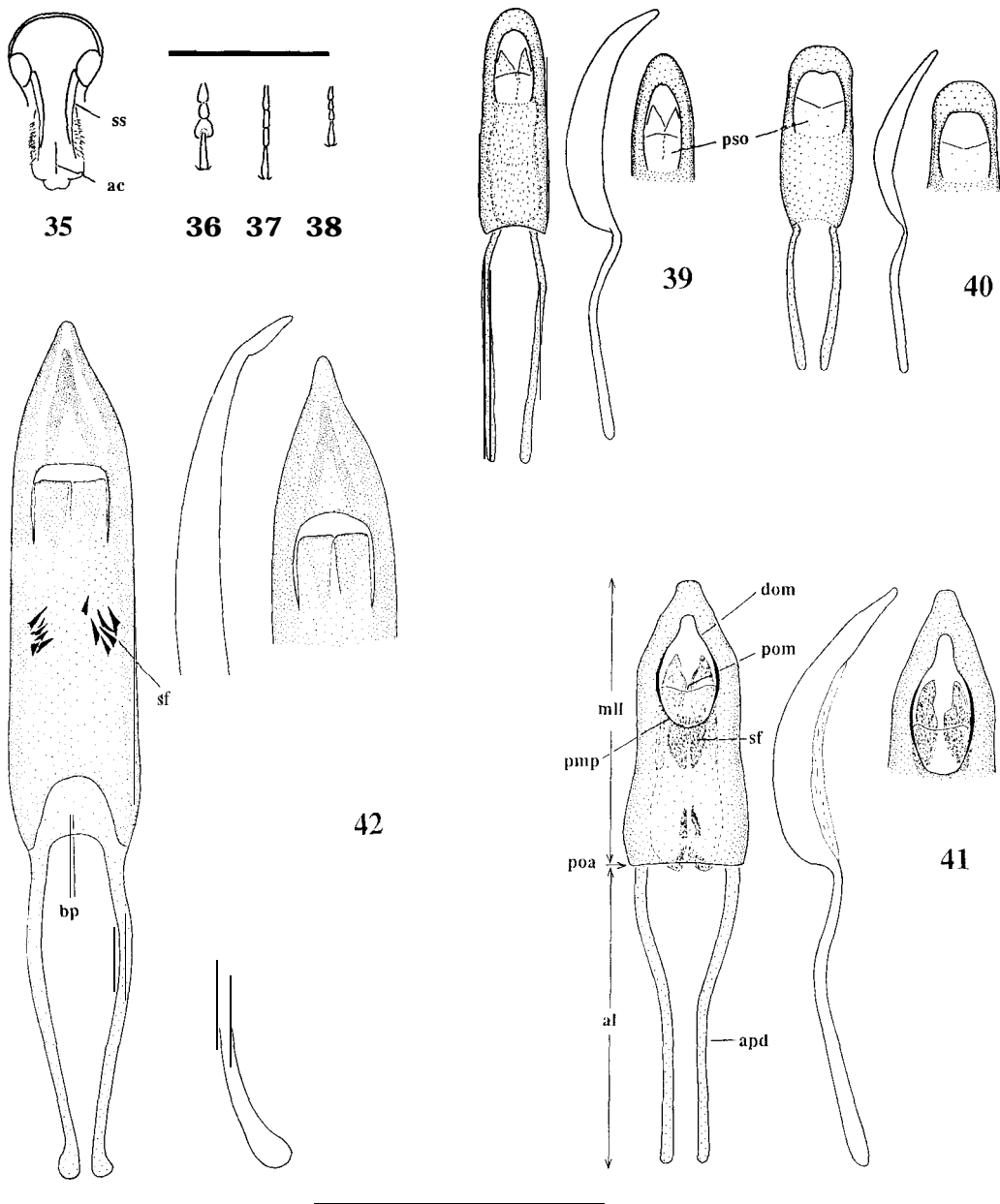
FIGURES 17-24. Photographs of: 17, 18, *B. proprius*; 19, 20, *B. fractus*; 21, 22, *B. buckinghami*; 23, 24, *B. rotundatus*.



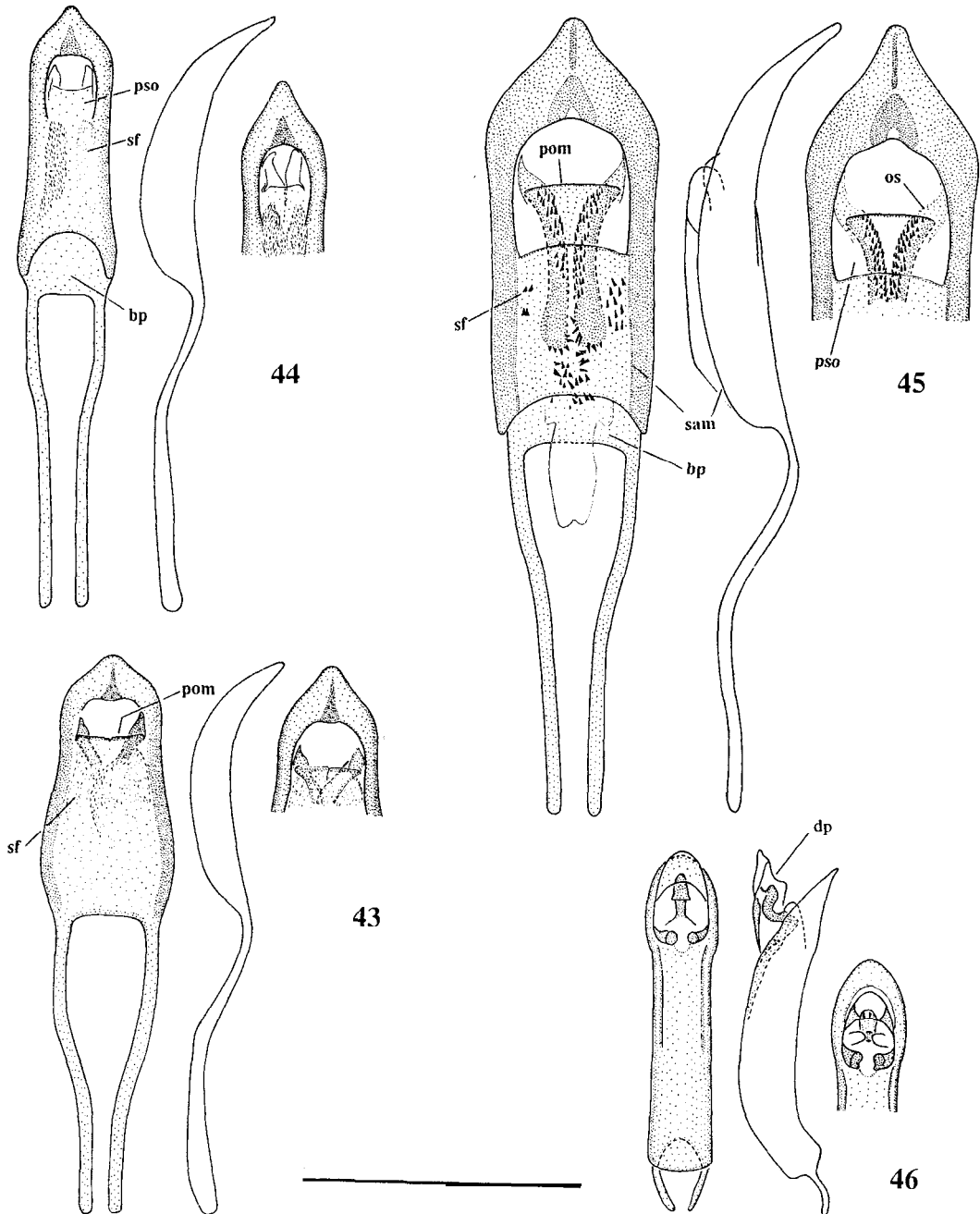
FIGURES 25-32. Photographs of: 25, 26, *B. youngi*; 27, 28, *B. fritodes*; 29, 30, *B. lewisi*; 31, 32, *B. subvittatus*.



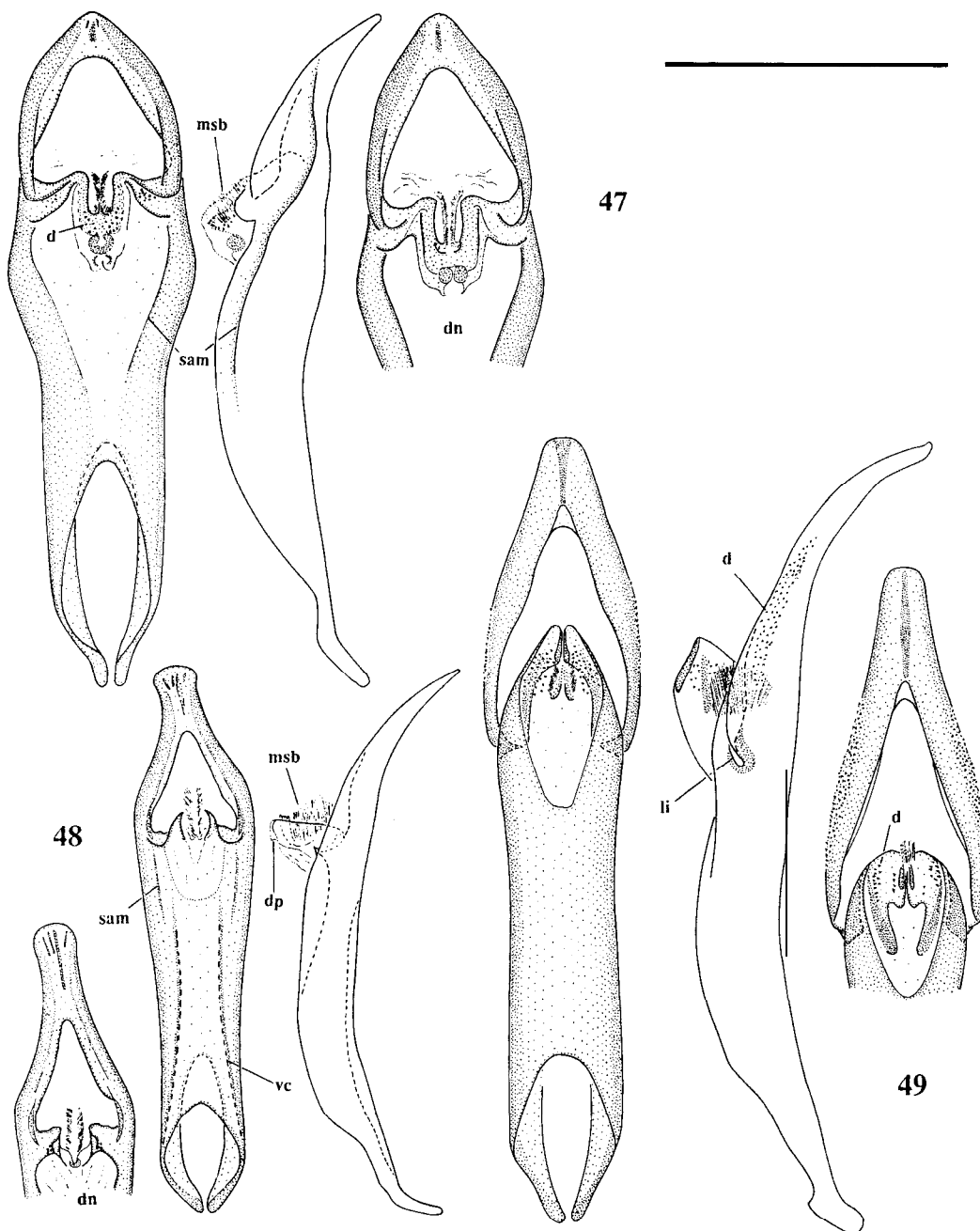
FIGURES 33-34. Photographs of: 33, 34, *B. tuberculosus*.



Figures 35-42. Structure of Japanese *Bagous*. Head and tarsi. 35, *B. occultus*; 36, *B. subcordatus*, 37, *B. buckinghami*, 38, *B. fractus*. Median lobe of males, dorsal view, lateral view and apical view. 39, *B. minor*, 40, *B. pygmaeodes*, 41, *B. kagiashi*, 42, *B. occultus*, 43, *B. ryukyuensis*. Abbreviations: ac = apical carina; al = apodeme length; apd = apodeme; bp = basal plate; dom = distal orificial margin; mll = median lobe length; pmp = proximal margin of pseudo-orifice; poa = point of attachment of apodemes; pom = proximal orificial margin; pso = pseudo-orifice; sf = spiculate fields; ss = suprascrobal sulcus. Scale = 1 mm.



Figures 43-46. Genitalia of Japanese *Bagous*. Median lobe of males, dorsal view, lateral view and apical view. 43, *B. ryukyuensis*, 44, *B. spiculatus*, 45, *B. bipunctatus*, 46, *B. proprius*. Abbreviations: bp = basal plate; dp = dorsal process; msb = median setal brush; os = orificial sclerite; pom = proximal orificial margin; pso = pseudo-orifice; sam = sublateral angulate margin; sf = spiculate fields. Scale = 1 mm.



Figures 47-49. Genitalia of Japanese *Bagous*. Median lobe of males, dorsal view, lateral view and apical view. 47, *B. rotundatus*, 48, *B. fractus*, 49, *B. youngi*. Abbreviations: d = denticles; dn = depression and less sclerotized area; dp = dorsal process; li = lateral incision; msb = median setal brush; sam = sublateral angulate margin; vc = ventral carina. Scale = 1 mm.

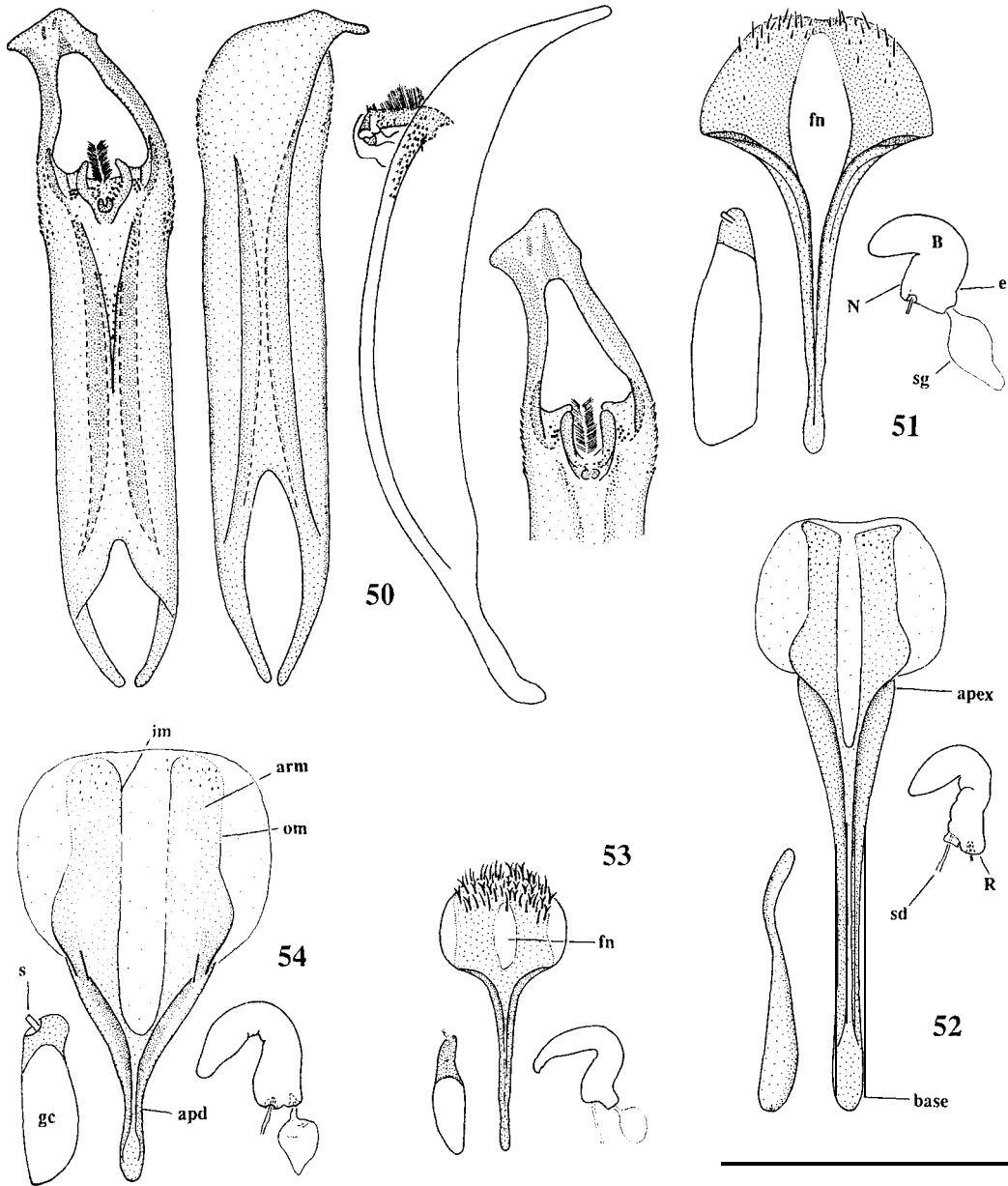
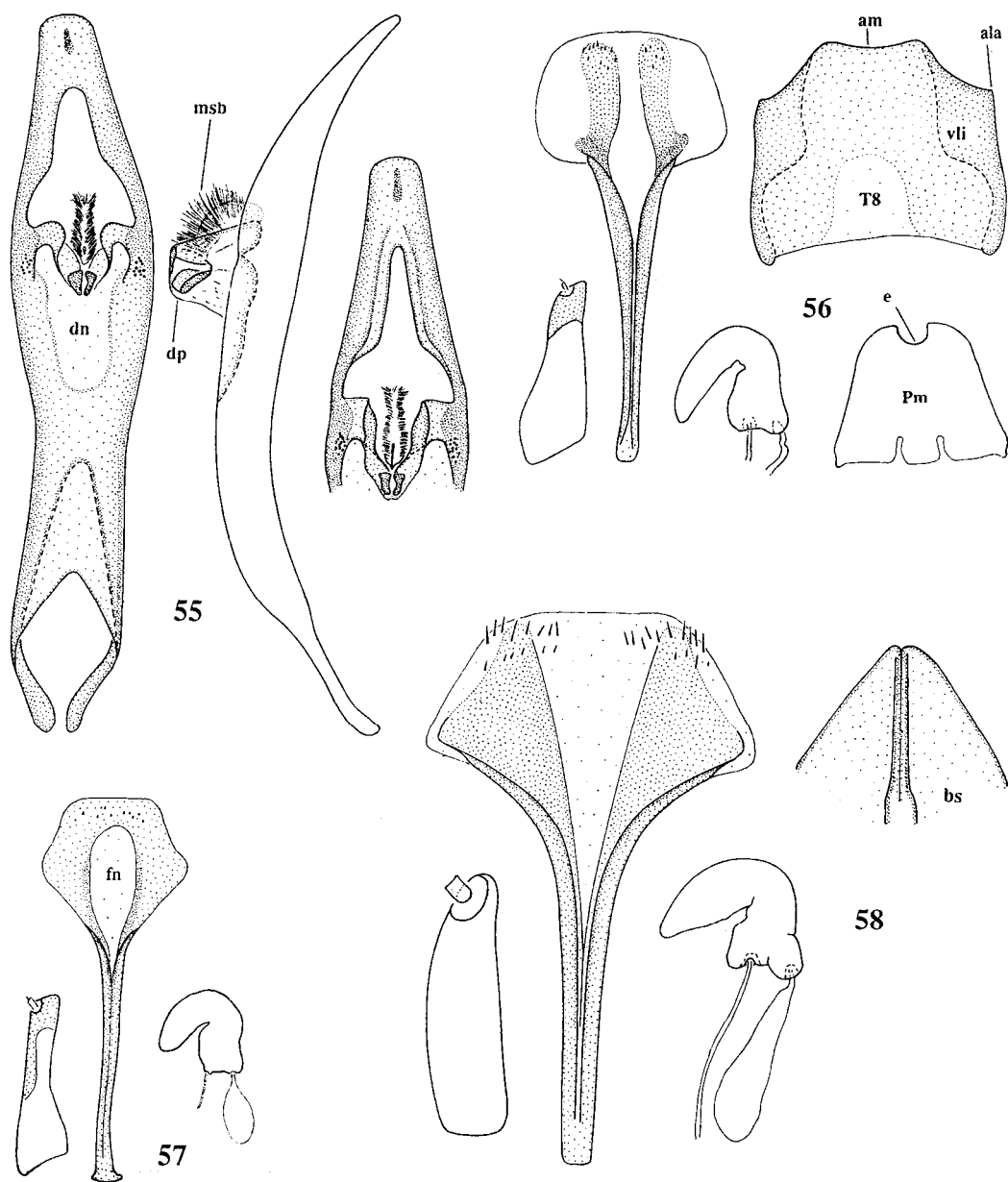
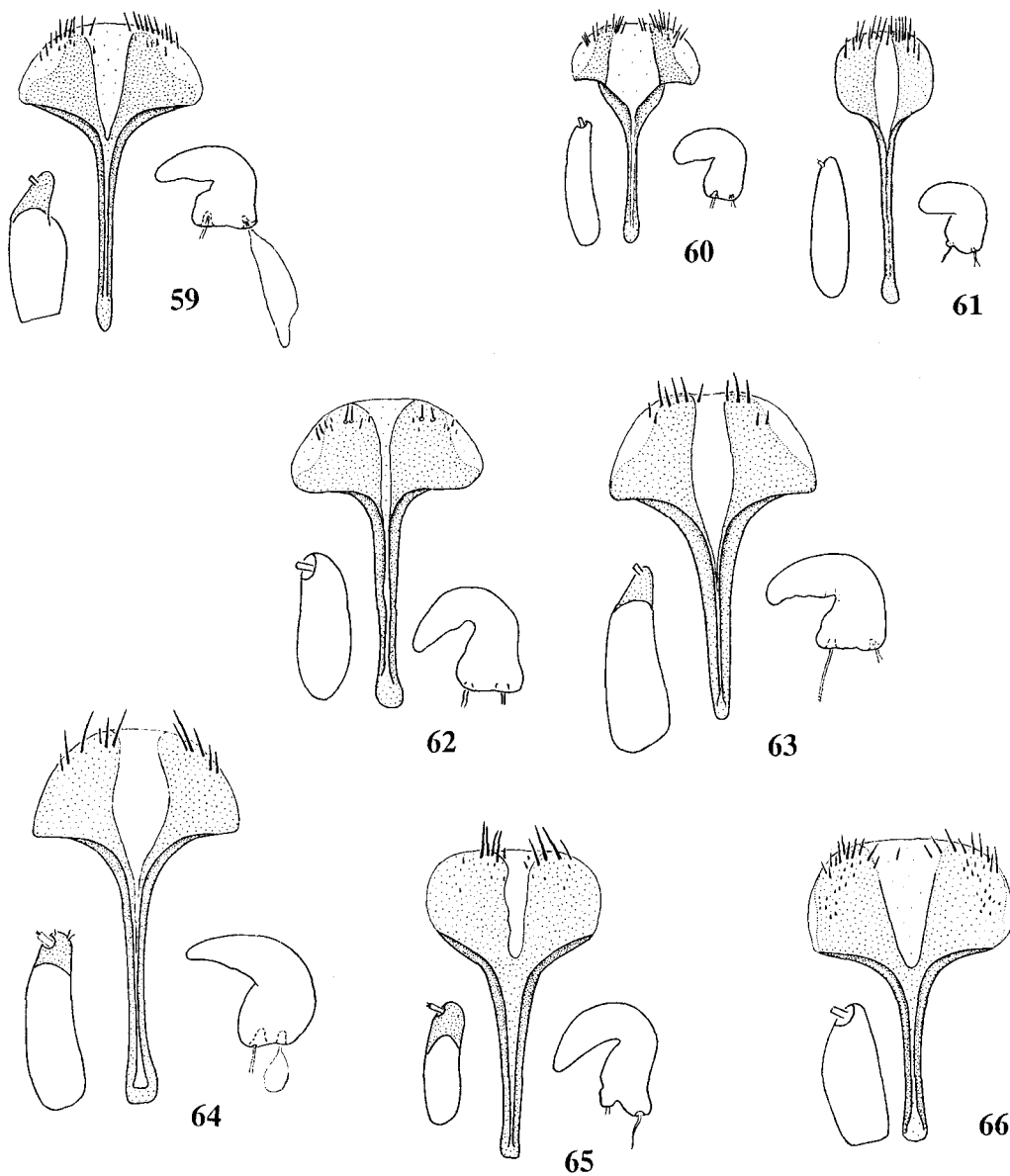


Figure 50-54. Genitalia of Japanese *Bagous*. 50, *B. friodes*, median lobe of male, dorsal view, lateral view and apical view. Sternum VII, spermatheca and gonocoxa of females: 51, *B. ryukyensis*, 52, *B. buckinghami*, 53, *B. proprius*, 54, *B. youngi*. Abbreviations: apd = apodeme of sternum VIII; apex = "apex" of apodemes; arm = arm of sternum VIII; B = body; base = "base" of apodemes; e = emargination between body and ramus; d = denticles; dn = depression and less sclerotized area; dp = dorsal process; fn = fenestra; gc = gonocoxa; im = inner margin; msb = median setal brush; N = nodulus; om = outer margin; R = ramus; s = stylus; sd = spermathecal duct; sg = spermathecal gland. Scale = 1 mm.



Figures 55-58. Genitalia of Japanese *Bagous*. Median lobe of male, dorsal view, lateral view and apical view. 55, *B. buckinghami*. Sternum VII, spermatheca and gonocoxa of females: 56, *B. fritodes* (with tergum VIII and pygidium), 57, *B. fractus*, 58, *B. bipunctatus* (with sclerite of bursa copulatrix). Abbreviations: ala = anterolateral angle; am = anterior margin of tergum VIII; bs = sclerite of bursa copulatrix; dn = depression and less sclerotized area of dorsal surface; dp = dorsal process; e = emargination; fn = fenestra; Pm = pygidium; T8 = tergum VIII; vli = ventrolateral inflexion. Scale = 1 mm.



Figures 58-66. Genitalia of Japanese *Bagous*. Sternum VII, spermatheca and gonocoxa of females: 59, *B. spiculatus*, 60, *B. pygmaeodes*, 61, *B. minor*, 62, *B. kagiashi*, 63, *B. subcordatus*, 64, *B. lewisi*, 65, *B. subvittatus*, 66, *B. tuberculosus* (spermatheca missing). Scale = 1 mm.